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The Place of Industries in Elementary Education

Katharine Elizabeth Dopp

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THE PLACE OF INDUSTRIES IN ELEMENTARY EDUCATION

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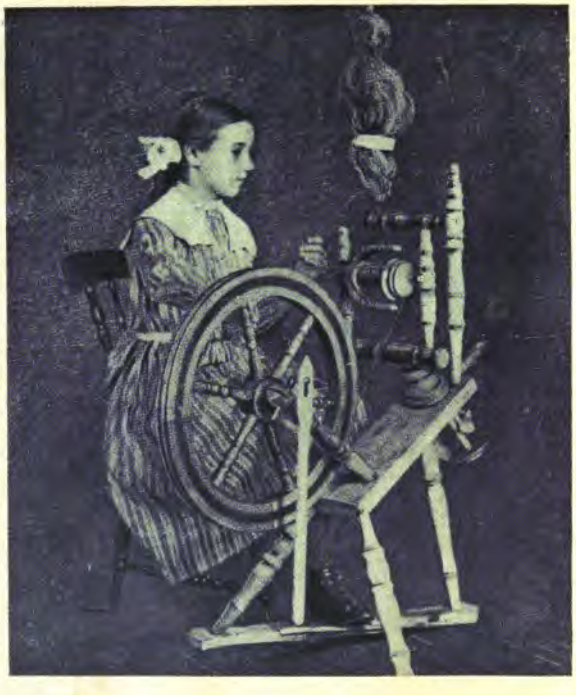

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The Place of [illegible] in Elementary Education

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The University of Chicago Press
Chicago, Illinois

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Published April 1903
Second Impression October 1903
Revised Edition June 1905
Second Impression May 1906
Third Impression August 1907
Fourth Impression April 1908
Fifth Impression October 1909
Sixth Impression September 1910
Seventh Impression January 1913

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Composed and Printed By
The University of Chicago Press
Chicago, Illinois, U.S.A.

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AUTHOR'S NOTE.

THE difficulties that beset the way of those interested in elementary education are many. They have called forth much discussion during the past decade, and already a great advance has been made. If this book contributes to the general movement it will doubtless be due to the fact that it suggests ways of bringing into vital relations forces and materials which, hitherto, have remained almost untouched.

The study here made is based upon several years' practical experience, during which many tentative efforts were made along lines marked out in this book, as well as upon research work in the Departments of Education and Sociology in the University of Chicago. To the men and women of these departments, from whom I have received much in the way of guidance and inspiration, I am greatly indebted. They all, I am sure, will recognize in the discussion of the stages of mental development the influence of Professor Dewey; and in the interpretation of primitive activities, that of Professor W. I. Thomas.

THE UNIVERSITY OF CHICAGO,
March, 1902.

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AUTHOR'S NOTE TO REVISED EDITION.

SOON after the publication of the first edition of this book, letters were received suggesting that it be expanded so as to serve as a teachers' manual. Although I had already undertaken a series which is a concrete expression of the theory presented, the length of time required to complete the work is so great that it has seemed fitting to take the suggestion and to present in the new edition of this book a chapter which it is hoped will prove helpful in bridging the gap between what we as teachers are actually doing and what we believe we should do. Comparatively few schools are yet equipped for practical activities, and few teachers are familiar with methods of using them as laboratory courses to the content studies. It has seemed best, therefore, to devote the new chapter (1) to ways of procuring a material equipment, and (2) to ways of using it so as to enhance the value of colonial history—a subject familiar to every teacher and taught in every school.

With the exception of the frontispiece, which is from the School of Education of the University of Chicago, the sources of the illustrations are indicated. These illustrations show more clearly than words the hold which practical activities have already taken upon the schools. No more powerful appeal can be made for such work than that which may be read from the faces of the children. K. E. D.

JANUARY, 1905.

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CHAPTER I.

INTRODUCTION.

One of the most striking characteristics of society today is the marvelous development that is everywhere manifest along industrial lines. In nearly every department of industry the simple processes which formerly prevailed have become differentiated into a great variety of activities, and all have been organized into a definite system. Methods of exploiting the earth in the search for raw materials, processes of manufacture, and modes of distribution and exchange have become wonderfully complex. The influence of this change is far-reaching. It permeates every department of life. It operates in the church as well as in the state, in the home as well as in the school. No institution of society can escape its influence.

Society today differs from earlier societies, not in its organic character, by virtue of which the life of one institution affects that of every other; it differs, rather, in the complexity of its organization, which frequently obscures the more fundamental relations which, in primitive societies, are laid bare to the view.

From the remotest to the most recent times,

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in the simplest as well as in the most highly organized societies, industry has been a dominant force in the upbuilding and maintaining of social structures. In the more simple social groups it is possible to perceive very clearly the fundamental place of industry in society and the vitality of its relation to all other activities in life. In such societies it appears as the matrix that holds within itself the other interests of life, which it nourishes until they become strong enough to support themselves. The vitality of this relation is illustrated in more developed societies in the decadence of those arts whose connection with the parent stock has been severed, as well as in the remarkable development of the same arts during the times when they have stood in such relations to the industrial life of the people as to be constantly receiving and giving strong currents of inspiration.

Human beings of all times have doubtless been impelled by other desires than those which underlie industrial activities; they have always been dimly conscious of unfulfilled desires. The fact that industry has ever exercised such a prominent place in conditioning other activities is not because others, at times, have not been valued more highly, but because industry is the substructure of society, which conditions its very existence. It was necessary to the maintenance

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of life before individuals had united to form social groups. It was an essential factor in the formation and maintenance of such groups, and has been a permanent factor throughout the ages in the development of the institutions of community life.

It seems evident, then, that that which is the condition of life itself and the fountain source of the arts and institutions of society should have a place in the education of the young, upon whom will soon fall the responsibility of maintaining and advancing the activities by which society is sustained and strengthened. This need has always been felt, and provision of some kind has always been made for putting young people in possession of such experience as is calculated to fit them for the serious work of life. The character of this training has varied with the people and the age, but in some form or other it has persisted throughout all time.

Among Aryan peoples, from the earliest time to the latter part of the Middle Ages, this training was generally attended to by the *family*, whether it was the original clan, the patriarchal group, the tribal circle, or the family artificially extended by personal servitude. During the period of *town economy*, which extended from the rise of the towns and the development of handicrafts in the latter part of the Middle Ages until the industrial

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revolution of the eighteenth century, the training of the family was supplemented and in some cases superseded by the system of apprenticeship. With the rise of *national economy*, technical institutions and engineering and commercial courses were established in order to meet the demand for trained workers to manage the various departments of highly complex industrial undertakings. No provision, however, was made for the training of the great mass of the workers for their life-work. This was partly due, no doubt, to the fact that the new inventions made it possible to utilize unskilled labor to a degree not known before that time.

The rapid development of means for cheap manufacture and transportation has resulted, as is well known, in the withdrawal of the industries formerly carried on in the home and the transplanting of the same into factories where the work is carried on with closed doors. The child of today is thus deprived, except in a few cases, of the opportunity to observe or to participate in the industrial processes that form the substratum of all of our social achievements. If the consequences of this situation were felt only in the output of our industrial institutions, the consideration of this subject might well be left in the hands of the captains of industry and the economists. If, however, the consequences are such as to affect

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the *quality of life* itself, the subject is surely one that cannot safely be neglected by those interested in the cause of education.

It is because it is believed that the industrial training of the young holds in solution the essential ideas that underlie the various activities of society, and that this substratum of experience in industrial processes is as necessary a condition for the normal development of the individual as racial industry has been for the maintenance and advance of society itself, that the question is beginning to command the attention of thoughtful people.

Under the conditions of modern life we can no longer expect the home to furnish the child with experience in industrial processes; we must look to some other institution. The institution that we look to most naturally is the school; but the common-school curriculum is already overcrowded, and, if new subjects are to be added by the process of aggregation, all interested in the work must object to any such change. Happily, however, in respect to the subject under consideration, industrial training, it is not so much a question of imposing greater burdens from without as it is of finding the means of reconciliation between the child and the subjects already there. The mere fact that every one recognizes the child as being burdened with his school work is signifi-

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cant. While it must not be expected that industry will of itself exercise a magic touch by means of which all the burdens of the school will be transformed, it is not too much to expect that it will exercise a potent influence, if introduced into the schools in an organic way, satisfying at the same time the demands of the child and of society. The difficulty in elementary education has not been in the child nor in the demands made by society; it has been in the failure to make use of that by means of which the two may be brought into vital relationship.

This work is an attempt to make clear that there is a closer relation than is usually recognized between the attitudes of the child and the serious activities of society in all ages. It is an attempt to bring together from the domain of education, on the one hand, and of anthropology, sociology, and history, on the other, ideas that will mutually reinforce each other. The territory is so vast, and the state of knowledge in the departments concerned is as yet in such an empirical state, that the value of a work of this kind consists rather in its power of suggesting new ways of dealing with old problems than in offering definite solutions to them. It is more important at this stage of the subject to get a general survey of the field than it is to work out in detail a small portion, without regard to its relations

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to a larger whole. The scope of this work forbids a minute examination of any one phase. The subject is treated in some of its more general aspects, and illustrations are introduced, particularly with reference to those phases to which little attention has yet been given.

In order to secure a basis for the work it has seemed best to consider, on the one hand, the several stages of industrial development in the race with reference to the educational significance of each, and, on the other, the successive periods in the development of the child. In the consideration of an industrial epoch an attempt is made to discover (1) some of the more important interactions that take place between man and his natural and social environment, (2) how these result in different forms of industry, and (3) how forms of industry influence the social organization of the people and the development of the sciences and arts. The attempt is also made to show that there is more than an accidental relation between the technique represented in the tool, and the intellectual, moral, and social condition of the people. Attention is given to those racial activities which, through physical heredity, have been potent in determining the psychical attitudes of the child, as well as to those which have survived as ideas, customs, and habits of thought, and which operate, through social heredity, in

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shaping our attitudes toward industry of various forms.

In the light of these facts regarding racial development and what is known of the successive stages in the life of the child, some of the more important critical periods in racial and in industrial development will be noted, and a deeper significance of each sought by reference to the other, as well as to the natural and social environment in which each is set. The attempt is made to separate the transient from the permanent factors in the successive stages of an activity, and to make use of the permanent factors in such a way as to secure a principle of selection and a guiding principle which will be of service in determining the conditions of education in the successive stages of child life.

In the selection of materials upon which to base this discussion, it may seem that the activities of primitive life have received an undue share of attention. But if it is taken into consideration that civilization is only as yesterday when viewed with reference to the long period of human development; that the deep-seated, permanent, and abiding impulses are the result of racial experiences before man had emerged from the savage stage; and that later racial activities influence psychical attitudes in a much less permanent and effective way, this method will, from the

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point of view of one who would interpret the child's interests and attitudes, perhaps be justified. It is hoped, moreover, that it will be shown to be justified from the point of view of the course of study.

The consideration of primitive life, then, will have a twofold purpose, (1) with reference to its significance in interpreting the attitudes of the child, and (2) with reference to what it has to yield, especially along social and technological lines, for the course of study. Only by laying hold of both our physical and social heredity can we be fully equipped for furthering the work of education.

Typical selections of materials from later stages of culture will be used to illustrate the character of work in the higher grades. To organize and adapt such material to purposes of elementary education is the work of years and requires co-operative effort. In this place little more can be done than to determine the principles of selection and to illustrate one method of application.

Advance in almost every line of culture consists in a more economical use of forces already applied, or in the harnessing of new forces to a work already begun. The educational process has been such as to involve a great amount of waste. The strongest forces available in the

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work of education have been almost untouched. In a few cases the relation of the child's psychical attitudes to their origin and to organized social life have been recognized sufficiently to arouse a demand in the educational world for literature dealing with the successive stages of racial development; but only rarely has it been recognized that, however valuable such work may be as one factor in the solution of the problem, and however much the child may enjoy such stories, to stop at this point is to throw away the kernel and be satisfied with the husk. Such an application substitutes stories *about* activities for the activities themselves; it is an undue emphasis upon the more passive, the receptive powers of human nature, and a neglect of the more active, the expressive ones; it is a stimulation of the imagination without a provision for a corresponding motor manifestation. How to make use of the emotional attitudes of the child that are usually allowed to discharge themselves without further educational significance than that they afford physical development and keep alive the emotions normal to children and necessary to vigorous growth; how to direct them in such a way as to afford the child, in each stage of his development, an experience suited to his capacity in the fundamental processes by which society in all ages

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sustains itself; how to transform the dramatic and play instincts of the child into the real interests of adult life without diminution in their vigor and purity—these are most vital problems in education.

Such problems will, doubtless, be solved in many ways in future times, for it cannot be supposed that any solution of a practical question will satisfy even all the people of any one period. The solution that is offered at this time is based upon the fact that the child, in the successive stages of his development, always has important problems of his own, which, if worked out, enlarged, and interpreted in the light of similar experiences of the race, represent a process which is a genuine reconciliation of the individual and society.

The child's problem arises in a present difficulty that he realizes with reference to his own natural or social environment. The enriching material, the subject-matter, may be selected from the racial experiences of any age. That which determines its fitness for the purpose is not the age from which it is chosen, but the psychical attitude to which it corresponds, the difficulty of the technique involved, the complexity of organization which it represents. Under such conditions the past is no longer isolated from the present in the mind of the child. It is an organic part of

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society as it is today. It is a fundamental factor in the educational process.

The history of industrial activities represents a fundamental factor in the education of the child, because it furnishes a series of typical problems that correspond to the changes in his own attitudes. Because the past still lives in the present, because its problems are simpler statements of the most fundamental problems of the present, the history of the industrial activities of the past is especially valuable as subject-matter in elementary education. That it is used no more than it is at present is due to the fact that no one has yet given sufficient attention to the subject to organize it with reference to present educational needs.

Nowhere is it more evident that a thorough examination of one line of culture leads one into the whole of life than in such an investigation as this. At each step one is brought face to face with problems which were not previously thought to be a part of the subject under investigation. It has not seemed wise to thrust these altogether to one side, for by so doing the purpose of the investigation would be, in a measure, defeated. There is some reason to believe that if, at times, what was considered a minor matter assumes a greater prominence, it is a factor that deserves attention. It is just because industry

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holds so many factors bound up in it that it is of such consequence in education. How these various factors become free, how they become strong enough to set up ends on their own account, how society is affected by these changes—all these questions promise rich suggestions with reference to present problems.

Such an examination as will bring to view the necessary conditions for the development of industries cannot ignore the vital relations that they sustain to the sciences and the arts. They are organic parts of the subject and should be recognized as such. If, in many places, relations of this character are passed by with little notice or even ignored, it is due to the limitations to which one is subject in dealing with a problem of so wide a scope, and not to the failure to recognize that they represent essential factors in the development of the subject.

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CHAPTER II.

SIGNIFICANCE OF INDUSTRIAL EPOCHS.

THE industrial activities of the race have been classified by economists into three main divisions. The earliest and by far the most prolonged period is that of domestic economy, or the period of *house industries*, which lasted from the earliest times until the rise of the towns in the tenth century. The second is the period of *town economy*, or the period of the *handicrafts*, lasting from the tenth century until the beginning of modern times. The third is the period of *national economy*, or the *age of machinery and the factory* in which we are living.

THE HOUSE INDUSTRIES, OR THE PERIOD OF DOMESTIC ECONOMY.

The house industries are especially significant with reference to elementary education. They represent the experience of the race in industrial activities, whether private or public, through the long ages which preceded the handicraft period. They are important as factors in the shaping of the early forms of our institutions, and give a significance to much that would be meaningless apart from such a relation. They represent the activities which were instrumental in the forma-

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tion of our physical co-ordinations and psychical attitudes. In relation to the early years of development they are much more important than the industrial activities of later periods, because they correspond more closely to the psychical attitudes of the child than do the activities of later periods. The activities of later epochs are not without their influence in shaping the attitudes of the child, but they operate more through social than through physical heredity.

No classification of the stages of domestic industry has yet been made that is not open to some objection. The activities of human life are not subject to a rigid classification. The more characteristic features of racial activities may, however, be organized under such terms as the hunting, fishing, pastoral, and agricultural stages, the age of metals, trade and transportation, the city-state, and the feudal system. Such terms serve the purpose of organizing activities which represent an increasing development of mind and a corresponding complexity in social structure.

In order to discover what place industry has had in these successive stages of racial development it may be well to consider the successive situations in which man found himself, the nature of his equipment, and the ways in which he dealt with the problems at hand.

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THE HUNTING STAGE.

From what the researches of the palæontologist, the geologist, and the anthropologist have revealed we are able to reconstruct in outline some of the more characteristic features of the life of man in western Europe during the mid-Pleistocene period.

Man found himself in a dangerous situation. The cave-bear, the cave-lion, the sabre-toothed felis (*Machairodus latidens*), the big-nosed, the small-nosed, and the woolly rhinoceros, the hippopotamus, and the mammoth were a constant source of terror. Packs of hyenas, wolves, panthers, and wild-cats were always near, ready to pounce upon their prey; and even the urus, the aurochs, the wild boar, and the wild horse, though usually peaceable, were formidable antagonists when aroused.

It is quite certain that all these beasts were not present at the same season, for some of them are tropical, while others are arctic species. Mr. Boyd Dawkins, who has given careful attention to these problems, believes that during the early part of the mid-Pleistocene period the different species migrated with the seasons.

The climate of this early period was characterized by less extreme temperature in summer and in winter than at present, and it was very damp. Toward the close of the mid-Pleistocene period it became much colder.

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The chief forms of plant life were evergreen trees, of which the spruce, the fir, and the yew tree were most abundant. Trees which shed their foliage were represented by the oak and the birch. The rivers were bright in places with yellow and white water-lilies, and their banks were shaded by laurels. A thick undergrowth of the sloe, the original form of the wild plum tree, formed thorny thickets which were places of refuge for the animals that were in need of protection. The marshes offered a heavy growth of grass, and were partly covered with alders, osmund royal, and marsh trefoil. Hornworts and weeds grew in the pools. Wild peas and beans, stringy-rooted carrots, rutabagas, and turnips grew in the open spaces on the hillsides. The cabbage, with its thick leaves, was found, but it had not yet developed a hard head. Wild flax and a variety of wild grasses covered the treeless plains and the open spaces of the upland regions. Such was the environment of the earliest people in western Europe of which we have any record. What was man's equipment at this time? How was he fitted to live in such a difficult situation?

The change from organic to human evolution was a gradual one. Such animal instincts as could lend themselves to social service survived. Advance from this point consisted, not in devel-

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oping new or better bodily organs, but in controlling them and in supplementing and multiplying their power by the use of external means.

Various scientists and artists have combined their efforts at different times to make restorations of the skeletons found in or near the caves of France. Huxley gives the following description of them:[1] "The anatomical characters of the skeletons bear out conclusions which are not flattering to the appearance of the owners. They are short of stature, but powerfully built, with strong, curiously curved thigh bones, the lower ends of which are so fastened that they must have walked with a bend at the knees. Their long, depressed skulls had very strong brow ridges; their lower jaws, of brutal depth and solidity, sloped away from the teeth downward and backward, in consequence of the absence of that specially characteristic feature of the higher type of man, the chin prominence."

Mr. Boas is authority for the statement that the savage had as great brain capacity as civilized man and that his mental processes were very similar.[2] In the early part of the mid-Pleisto-

[1] For further information on this line see WORTHINGTON SMITH, *Man the Primeval Savage*, Chap. I, and H. N. HUTCHINSON, *Prehistoric Man and Beast.*

[2] FRANZ BOAS, "The Mind of Primitive Man," *Journal of American Folk-Lore*, Vol. XIV, p. 1.

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cene period man must have needed his hands for purposes of locomotion, for until he had conquered fire and learned to manufacture and use weapons the trees offered him the safest retreat from his numerous enemies. Man of this period had hands, but they were not yet free for the service of the mind; he was destitute of all means of shelter except those supplied by nature; he had no assurance of a regular food supply; he was without clothing, without implements of labor, and the weapons of offense and defense.

Compared with any one of the animals man was outranked in some respect. He could not run as fast as the horse, swim as well as the fish, fly as the eagle, crawl as the serpent, or render himself inconspicuous by changing his color to correspond with the natural objects with which he habitually came in contact, or by maintaining such a control of his muscles as the wild calf and other animals do when they remain motionless in order to be unobserved. He was not protected with armor as the turtle is, with a thick skin as the rhinoceros, with a heavy coat as the mammoth, or with feathers and fur as the birds and beasts of prey. In his conflicts he could not strike as the cave-bear, kick as the horse, crush as the rhinoceros, gore as the urus, or pierce and rend as the tiger. In the exer-

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cise of the senses and in muscular force he was surpassed by many of them.

In what then did man's superiority consist? How was he able to exercise control over such an environment? His advantage seems to have consisted in this: he had developed associative memory to a degree surpassing that of any creature; and, although physically he was surpassed in some respect by every species of animal,[1] he united in one body the variety of movements and methods of resistance used by every species of animal. The special superiority of each animal had been gained by surrendering the possibility to advance along other lines. Animals have paid a dear price for their special skill. The hope of the future seems to lie in the undifferentiated form. This appears to be true of both animal and human life.

Associative memory by means of which man is able to inhibit instinctive action and so secure an advantage that a former experience has shown to be desirable, and an erect body with free hands by means of which he can perform a variety of activities, are the points of leverage by means of which man has lifted himself above other forms of animal life.

The body is thus a storehouse of the principles

[1] O. T. MASON, "Primitive Travel and Transportation," *Smithsonian Report of the United States National Museum*, 1894, p. 257.

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of invention;[1] it furnishes the motive power, and contains the pattern of the various types of tools and several mechanical principles and simple machines; it has furnished the original standards of all modes of measurement; it is the predominant factor in rhythm, which is the germ of the fine arts; it has furnished the activities which form the root words of our language, and the meter of our poetry; and its activities are the basis of all possible expressions of emotional life.

The early history of human activity is an account of how man, by means of associative memory and the powers of his body, succeeded in establishing relations with his environment. Whether man originally was a social or solitary creature is not settled beyond dispute. That all

[1] *Ibid*, 1894, p. 252: "Jeremiah Head, in speaking of the mechanical principles of invention actually existing in the body of man and referring to some involving the carrying art, says that the human foot contains instances of the first and second, and the forearm of the third order of lever. The patella is a part of a pulley; there are hinges and ball-and-socket joints with lubricating arrangements; lungs are bellows, and the heart is a combination of force pumps; the wrist, ankle and spinal vertebræ form universal joints; the nerves form a complete telegraph system with up and down lines and a central exchange; the circulation of blood is a double line of canals, in which the liquid and the boats move together, making the circuit twice a minute, distributing supplies wherever required, and taking up return loads without stopping; it is also a heat-distributing apparatus, establishing a general average, as engineers endeavor to do in building."

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other interests were dominated for a considerable time by the need of the individual for food and protection there is little question. That for a considerable period man lived chiefly upon vegetable food and such forms of animal food as he could obtain without weapons is undoubtedly true. The instinct of self-preservation compelled him to seek to escape conflict with the beasts of prey. In the exploitation of his environment in search of food it was necessary for him to be alert in recognizing sights and sounds. Noise meant danger, and he who did not respond to this instinctively was liable to lose his life. Reflection, under such circumstances, was too expensive a form of specialization to be indulged in. Fear at this time was a virtue necessary to the preservation of life.

Previous to the use of fire, owing to the burden placed upon the hands in locomotion, upon the teeth and digestive apparatus in grinding, crushing, and digesting uncooked food, and on account of the expenditure of energy in maintaining the necessary temperature of the body without the aid of clothing and fire, man had little surplus energy upon which to draw for satisfying other needs than those directly related to gathering food and escaping from the attacks of wild animals. Yet even in this age he began the work of supplementing the power of

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his body by means of the simplest implements and weapons.

In this earliest period of which we have records man established destructive relations with plants and the smaller animals. He sought to avoid conflict with the larger animals; yet he could not help being curious about them, for curiosity was a necessary quality in such an environment as the one in which he lived. The curiosity, the fear, and the wonder with which he regarded these creatures undoubtedly were serviceable in the conquest of fire which was first regarded as a wild beast. The significance of this conquest is inestimable, and it is not strange that people worshipped the fire for many ages, and that, in later times, the unknown hero who made the conquest was thought of as a god. The change in industrial and social life wrought by this conquest ought, even in present times, to place the conqueror high in the ranks of industrial heroes.

Sympathetic relations with fire once established, social life is assured. The protection thus afforded from the attacks of wild beasts was sufficient to relieve man of a great strain as well as to free his hands for a higher service. Under such conditions it was possible to accumulate a greater surplus of nervous energy than before, which could be drawn upon for various purposes. Although in many respects the individual still

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supplied his own needs, the use of fire involved the beginning of the division of labor and co-operative action. The women naturally cared for the children and stayed near the fire. Because they were not free to travel far from the fireplace, they gathered such plant foods as were available and attended to the household duties. The men were free to engage in a more vigorous and strenuous life. The presence of a common enemy aroused common action, which required more thought than individual action and was by no means achieved without many tentative efforts.

The successful conflict with wild beasts was apt to exhaust the stored-up nervous energy, but it provided food and hence leisure for some time. Abundance of food and leisure resulted in the accumulation of new stores of energy, which were bound to find expression. Such animals as the dog and the cat can remain in a passive condition for long periods, but with the human being it is impossible. The stored-up energy must find expression. It is in such periods as these that we find activities similar in kind to those performed at other times, but different in their end. Free from the conditions imposed by the real hunt, the savage plays he is hunting, and we have the beginning of the dance. In the real hunt men are united by a common need and participate in a common emotional reaction; in the dramatic

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representation of the hunt they are aroused by a common feeling and purpose, and spontaneously respond to the same. The rhythmic response of the individual receives stimulus from that of his fellows, and, through suggestion, becomes modified until each one surrenders himself to the common feeling through which the individuality of each becomes fused in that of the group.

At other times man may expend his surplus energy in the search for bright and shining objects, which he may pierce and string, and we have the beginning of dress and decoration; or he may trace in the sand, or on the walls of his cave, or on the bones of animals he has slain, mere lines at haphazard, until by a happy co-ordination he produces a semblance to some familiar form, and we have the beginning of drawing. It would be easy to multiply instances of this kind; but these are sufficient to illustrate the fact that the beginnings of art depend upon leisure and an accumulation of energy, and that the art instinct, which is bound up at first with the workmanship instinct, becomes free only as less strenuous conditions of life afford room for its manifestation. The pleasure afforded on account of the intellectual perception of likeness and the emotional feeling of power stimulate to further activity as opportunity is afforded, and the action passes from the domain of the acci-

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dental and becomes more and more subservient to the dominant desires of the individual.

The fact that hunting peoples surpass pastoral and agricultural peoples in representative art is largely due to the fact that among hunting tribes every man is obliged to hunt and to provide himself with weapons. In the hunting stage every one had to be a good hunter and a good handworker or die. The co-ordinations made use of in his crafts supplied the necessary skill for the early draftsman and carver; the intimate acquaintance with animals made necessary by his mode of life developed a sympathetic interest in animal forms; hence it is not strange that the drawings and carvings of the cavemen of the late Pleistocene period have never been surpassed among nature peoples. Neither is it surprising that the arts which require considerable leisure were not cultivated.

Social life reacted upon industrial activities in various ways. Even in cases where the individual supplied his own needs the mere presence of his associates was sufficient to give a richer meaning to his own work. It no longer meant the mere satisfaction of physical needs. The need of social approval was felt, and efforts to exhibit self so as to gain that approval were aroused. The greatest social need of the age was for courage, daring, muscular strength, sup-

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pleness, alertness, endurance, and power to secure co-operative action. He who could prove that he possessed such traits found favor with his people. It is this fact that makes the trophy of a successful encounter significant. This, too, may account for the method of showing superiority by means of boasting, or by taunting the enemy, or of attracting attention by means of scarification or ornament. Anything that could secure favorable attention to himself from members of his group, and particularly from those of the opposite sex, was quickly appropriated.

Any one who has taken the pains to study the subject of primitive decoration knows that in many cases the ornaments must have cost many days of what we should call tedious, persistent effort. What was it that sustained the savage in such activities as these? It was the sustaining power of an idea. The savage had an ideal which he was striving to realize. He was creating something. He was not engaged in producing something foreign to himself, but that which was considered as much a part of him as one of the organs of his body. He was increasing his own power, he was enhancing his personality. This was what sustained him as he worked. This was what stimulated him to renewed effort in carrying to completion a work which, deprived of these personal and social associations, would have

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been intolerable. The self-exhibitive instinct thus appears to have been one of the most potent forces in the training of man to persistent, intellectual control of his powers through the use of his hands.

As man increased his power by refraining from purely instinctive action and by making use of his experiences in devising more and more indirect modes of reaction; as he came more under the influence of social forces, he began to dominate his environment to such an extent that the minds of the animals were affected by it. Man's cunning thus developed animal cunning. It is probable that this change took place in the grass-eating animals as early as the beginning of the late Pleistocene period. At this time the arctic mammalia took possession of the land and occupied it in company with those forms that characterized the preceding age, with the exception of the *Machairodus latidens* and the big-nosed rhinoceros, both of which had become extinct, and those living species that migrated at this time on account of the intense cold. There was thus a change in the situation brought about by the intense cold, the absence of so great a supply of vegetable food, the presence of new animal forms, the extinction or migration of others, and the change, in the habits of those that remained, due to the cunning of man.

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The increasing complexity in the situation made it necessary for man to find new resources within himself by means of which he could cope with the new and difficult problems. There was greater need of craft, foresight, endurance, and the speed that can result only from careful attention to means of preserving the suppleness of the limbs.[1] And man responded to the demands of the age. Each new difficulty was removed or lessened by the invention of traps, the improvement of weapons and other devices by means of which the warfare upon animals could be maintained; the earth was rendered more habitable by the removal of the more formidable antagonists; man learned to carry on more complicated co-operative activities made necessary by the complexity of the situation; and he made use of his leisure time in developing the industries and arts. Such forward steps constitute the history of the intellectual advance that man made at this time. They reveal the path by which man learned to modify his instinctive reactions by the use of associative memory under the impulse of the social needs of the age in which he lived. Physical needs alone could have been satisfied without so great an effort. It was the

[1] PROFESSOR W. I. THOMAS has called attention to the significance of this fact in relation to the division of labor between the sexes, in an article entitled "Sexes in Primitive Industry," published in the *American Journal of Sociology*, Vol. IV, p. 474.

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social needs which stimulated man to his bravest deeds as well as to those quiet, tedious activities necessary in order to manufacture the weapons, implements, and ornaments without which it was impossible to gain the approval of his group.

A superficial examination of the activities of the age may seem to warrant the conclusion that it was an age characterized by the destructive spirit. A deeper study reveals the fact that in its outcome, at least, it was *constructive*. Viewed with reference to the social need of the age destruction was more significant than construction; but then, as now, destruction and construction were but the two phases of one activity.

Although man of the hunting stage had not reduced his knowledge to intellectual formulas, he had made considerable progress in the sciences and the arts. He had gained this knowledge under the impulse of his need of food, protection, shelter, and clothing. He was familiar with the habits of all the wild animals of his locality, and with most of the useful and poisonous plants. He was familiar with the topography of the various regions in which he lived and with the special advantages afforded by each. He knew the signs of the weather and the relation of the changing position of some of the heavenly bodies to coming changes in his own activities. He had learned the limitations

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and the possibilities of the raw materials with which he worked, how to select the best materials for his weapons, implements, and utensils, and how to manufacture and manipulate the same. He had learned how to submit himself to a leader in time of danger and how to take the lead. He had learned how to live in sympathetic relations with members of his own clan and how to gain the social approval of the members of his group.

THE FISHING STAGE.

The earliest fishing peoples of whom we have any records are those whose history has been preserved in the kitchen-middens or shell mounds, which are still found along the coasts of the Atlantic as well as along the lower courses of many rivers tributary to that ocean. These people are usually placed in the epoch immediately following the Pleistocene period, and they represent the earliest people of the age frequently characterized as the *Polished Stone Age.*

The climate had become more like what it is today. All the larger forms of animal life which had characterized the preceding age were now extinct with the exception of the Irish deer, which was becoming rare. The arctic mammalia had withdrawn to the north, and the forms which have existed either wild or in a state of domestication from that time till within comparatively recent times prevailed.

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The situation at this time was less dangerous than during the Pleistocene period, owing to the destruction of the more formidable of the wild animals and the enlistment in man's cause of the dog, which was domesticated during this period. The problems of the hunter of this period were similar in kind to those of the Eskimo before the introduction of improved implements. In fowling and fishing man had new problems to solve. In hunting the conflict was with the animals that lived only on the land, but in fowling and fishing man had to deal with animals that inhabited elements inaccessible to him. How man learned to lengthen his arms by means of poles, substitute pieces of bone or hard wood in place of fingers, rude rakes for hands, dip-nets in place of the scoop made with the two hands, hooks in place of the bent fingers, fish-weirs and stones in place of natural means of enclosing fish in a shallow place; how he learned to wall in with stones large flats, and so pen in the fish brought in by the tides; how he made fish-weirs in the shallow waters—these are some of the problems that man dealt with in the simplest stages of life by the sea.

Even after man learned to hunt the animals on the land and catch the fish in the water he was unable to capture the birds that lived on the sea. They presented to him a complex problem, for

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they could walk or run on the land, fly in the air, and swim in the water. Buffon, the great naturalist, wrote that if the wild duck had not been obliged to come to the land in nesting time it probably would have escaped from man, if not altogether, yet for a much longer time than it did. Man early learned to take advantage of the young ducks of the marshes before they had learned to fly; he learned to swim below the surface of the water, breathing through a hollow reed while he grasped and drew one after another of the unsuspecting fowls beneath the water; he learned to out-wit them with smoke, baits, and traps, and, later, after he had domesticated some of them, with their own kind. In so doing he grappled with problems that made demands for less force but more foresight, more cunning than had been necessary before.

The shoals of deep-sea fish that came to the shores or up the rivers in the spawning season and later disappeared, tempted man to follow. The desire to find access to these stores of food supply added its weight to curiosity already reaching out to comprehend the mysteries of the winds, the waves, and the changing character of the ever-present sea.

An account of the ways in which man utilized his own body, and the suggestions of his environment in selecting and manufacturing devices

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by means of which he made himself master of the sea and the fowls of the air, is a chapter not only in the history of industry but in the acquisition of human freedom.

In general the activities of this period may be characterized as less dominated by physical force, and affording a larger place for the play of the mind in more subtle fields. The life of the hunter was spasmodic, irregular: that of the fisherman was more regular, more continuous, more characterized by co-operative action. So important was the dance as a means of securing union of effort, so close was the relation between the co-ordinated movements there represented and those in the actual operation, that the person who was so careless as to make a mistake in the dance met with the severest disapproval of his group. Few of the activities of the fisherman could be carried out successfully without co-operative action. Co-operation in deep-sea expeditions was impossible without careful organization, which was made possible only through the unifying power of rhythm. The man who could *feel* the situation in advance, and who could represent it in the form of a dance, was the industrial chief, who led in the adventurous undertakings on the deep sea.

Relations once established with the inhabitants of the land, the sea, and the air, a more steady

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supply of food was possible than before; a greater surplus of energy was available. This was largely utilized in the manufacture of fishing tackle of various kinds, boats, rafts, basketry, pottery, and in the invention of different forms of the dance, which had not yet set free poetry and song, and which had not itself become free from the controlling power of industrial activities.

Just as the hunter read into the natural features of his environment the meaning of his own activities and gave us the germs of our hunting myths, so the fisherman interpreted the natural life about him in the light of his own experience, and gave to the world the beginnings of sea-lore. The subtlety of the elements with which he had to deal was not without its influence in determining the character of his thought and feeling. The ever-present yet ever-changing sea and sky were real lessons in the philosophy of life.

THE PASTORAL STAGE.

The transition from the hunting and fishing stages to the pastoral stage is a gradual one. The situation differs with local conditions, but there are always permanent factors operating to induce man to make the change. The hunting life becomes more and more strenuous as the wild animals develop more and more cunning under the influence of man's presence. Even though man in the Pleistocene period succeeded in rid-

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ding the earth of the most terrible of his antagonists, beasts of prey still survive and prey upon the more gentle grass-eating animals, and even make attacks upon man himself. The grass-eating animals, which form the food supply of these creatures as well as the larger part of the food of man, become more alert, more skilful in eluding their enemies; but in spite of this their numbers become reduced. The natural increase in population, together with that caused by invading tribes, tends to reduce the number of animals to such a degree that it is no longer possible for a given area to support the life of the beasts of prey and the human inhabitants, who depend upon hunting as their chief means of subsistence.

Parallel to the changes already noted there take place changes which represent more and more complex methods of hunting. Traps by means of which animals may be deceived and captured alive are invented. Frequently, no doubt, young animals are caught in traps and taken home for pets for the little ones. These, which remain in the care of the women and children for the most part, are found useful as food in times of scarcity. The advantage of the presence of animals in a semi-domesticated or domesticated state is perceived and remembered. That which took place by an accident or for the

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A Deep-seated and Permanent Instinct.
(work of miss L. M. Chillingworth, New Haven, Conn.)

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sake of pleasure, finally becomes a serious business.

Man finds that by establishing sympathetic relations with the grass-eating animals he can live on a smaller area than by hunting them. These relations, however, bring him face to face with a whole range of new problems which require more forethought and regularity than were necessary before. When man lived as a hunter or a fisher the animals that furnished his food cared for themselves. He merely found ways of capturing them as he needed a supply. Now he has a whole range of duties, which bring little return for some time. The end of his action is more distant. It is no wonder that many tribes, discouraged in their efforts to find good pastures and water for their flocks, and in futile attempts to protect them from wild animals, hostile tribes, and the winter's cold, revert to their previous mode of life. But it is equally apparent that the tribe that meets these difficulties successfully, that increases in wealth by the rapid increase of flocks and herds, as well as by the spoils of war, will become attached to this mode of life—a life that offers sufficient play for the conflict interest to afford satisfactory emotional reactions, and that affords, for the first time, a regular supply of nourishing food and a great deal of leisure time

It is not accidental that art flourished in the

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pastoral period. Music and musical instruments, which were used for purposes of signals and for regulating rhythmical movements of the hunting and fishing dances, now made a rapid advance; and, although they did not become entirely free from the industrial activities of the times, they were not so distinctly subservient to utilitarian needs as before. It was during this period that the story-teller, the dancer, and the singer emerged from the mass in response to the need of a more adequate means of securing satisfactory emotional reactions.

It was at this time that the arts of spinning, weaving, dyeing and the subsidiary activities connected with the textile art were developed. The skill acquired in the hunting and fishing stages with sinews and various forms of woody fibers, when applied to wool and flax resulted in greatly improved methods of clothing, in a higher degree of skill, and in a development of art forms in which music, poetry, and the dance were still intimately associated.

Much of the surplus energy afforded by the easy life of the developed pastoral stage was expended in warfare. The accumulation of property offered a sufficient material inducement, but this was subordinate to the pressing needs of a strong, emotional reaction which the ordinary duties in the tranquil life of the shepherd did not

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afford. In so far as the destructive spirit of warfare prevailed, it interfered with the development of broad sympathies, which are necessary to the highest manifestation of art; but it fulfilled a social service in so far as it secured a necessary means of recreation, and organized society into larger and larger political groups. It was through war that society became organized, that political institutions were established. Even though these institutions never attained stability in the pastoral stage, the framework was laid, so that later tribes could utilize the results achieved in the upbuilding of more permanent and better organized societies.

Perhaps the most valuable contribution that this stage of culture has made to the world is its humanizing element. This was developed partly by the need of sympathetic relations with the domestic animals, and partly by the spirit of reverence and veneration that was fostered by the patriarchal family, which was formed in response to the centralizing tendency of the activities of the pastoral life. The young hunter depended largely upon his own efforts and could easily withdraw himself from his group, for a time at least. The shepherd boy was bound to his flocks. He had no means of support outside of the family ruled by a patriarch.

Industrial dependence undoubtedly was a

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potent factor in developing a sense of social dependence. Both fostered a peaceful life within the group. Even though the pastoral peoples were undoubtedly hostile to strangers, their mode of life developed sympathetic relations within the group. The kindness of old age found its counterpart in the gentleness that it fostered in the care of the young. The establishment of these sympathetic relations at home and hostile ones abroad secured in social and political life a co-operative action and an organization of effort, which could not have been secured by the industrial activities alone.

THE AGRICULTURAL STAGE.

While still in the hunting stage considerable progress had been made in agriculture by women. The irregular life of the time, however, seriously interfered with its development, and often the crop had to be left before it was ripe for the harvest. Although developed agriculture is found in the fertile lowlands it was not in such places that it originated. It is probable that the hunters on the wooded hills, on account of the pressure of the population, depended more and more upon the exertion of the women to eke out an existence, and that the terrace gardens whose remains are still found on many hillsides represent the first organized attempt to maintain society by the cultivation of plants.

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In many cases the domestication of animals by the men and the cultivation of plants by the women developed side by side. But unless the men of the tribe were strong enough to protect their animals from the raids of the strongest shepherds, they were obliged sooner or later to take upon themselves the work of the women. By bringing to woman's work the superior technological skill developed in the contests with wild animals during the hunting stage, and by being able to specialize to an extent that woman has never been able to do, man was able to get far greater results from the cultivation of the soil than had been possible under conditions that had prevailed previous to this time. Agriculture was no longer one of the many occupations of woman; it had become the principal occupation of man.

Where conditions were such as to secure the necessary protection, the agricultural life was of great educational value to the race. Protection was often gained by establishing settlements upon islands, naturally fortified peninsulas, barricaded marshes and, finally, resort was had to pile-dwellings erected upon the lakes. It is significant that fortification appeared with the settled agricultural life. Agriculture required much thought and severe bodily exertion. The products of such labor were too precious to be left unprotected. The hunter, the fisherman, or the shep-

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herd, if driven from one site, could find many others equally satisfactory; but the farmer, who put his thought and his labor into the soil, valued it too highly to yield it without a struggle. Because the shepherd's life cost him so little bodily exertion, because he could increase his property so rapidly, he esteemed it lightly; but it was very different with the man who tilled the soil. He not only expended muscular force but he busied himself in discovering nature's secrets. He had to learn how to prepare the soil in the best way with the crude tools at his disposal; he had to learn the best time to sow the seed and what seeds would grow rapidly enough to mature before the early frosts; he had to invent ways in which to protect the growing crop from birds and beasts and from the thoughtless members of his own clan, who were with difficulty prevented from consuming the crop before it was ready for the harvest. He had also to invent tools and to learn how to utilize animals as a motive power in work; he had to invent harnesses, evolve carts, measure time, and regulate consumption as well as production.

The conditions which man had to take into consideration in agriculture were more complex than in any other mode of life yet attempted. Plants, unlike animals, cannot be depended upon to reproduce and preserve themselves. They

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are subject to constantly varying dangers. There is need of constant observation of the phenomena of climate, unceasing prevision, and unremitting toil in order to deal successfully with the series of difficulties that beset the way from seedtime to harvest. The agricultural life thus made extreme demands upon both mind and body and afforded little opportunity for a satisfactory emotional reaction. The stimulus was so slight, the problem so vague, the end so distant, the conflict interest so reduced, that there was difficulty in maintaining interest sufficient to secure a successful outcome. For this reason it was necessary to reinforce the stimulus by artificial means. This is the significance of the festivals which accompanied every important step in the season's work. This is why religion was summoned to lend its support in securing the necessary regulation of activities of this difficult mode of life.

The advantages of agriculture as a means of furnishing an abundant supply of food from a small area soon became apparent. Man's labor acquired a value hitherto unknown. Captives in war were now too valuable to be put to death. They were enslaved and compelled to carry on agriculture under the supervision of their conquerors.

On the wide prairies the shepherds could

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live for a long time, but as they came nearer the forests and banks of the lakes and streams it was necessary to take up the plow; but land once under the plow does not turn back into pasture land. The advances of the pastoral people were sudden and rapid, and their losses were the same. The advances of the agricultural people were gradual but permanent. In the conflict agriculture was bound to win in the end.

The predatory instinct, which was developed by the warlike pastoral peoples who would not submit to a life of labor was, then as now, turned to social ends. In those days it united people and produced a feeling for political order and subordination to which the settled life of agriculture served to give stability. In these later times it survives in the organizer of great industrial and commercial enterprises, and in the leaders of great scientific explorations and discoveries.

THE AGE OF METALS.

During the earlier stages of culture man frequently made use of such metals as he could find in the pure state for ornaments; and it not infrequently happened, in localities rich in native copper, that it was made use of for implements and weapons. But this process involved little of the insight and skill of the real work in metallurgy. How man first discovered the secret treasures of

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the earth, how he harnessed the wind and fire to do his bidding, will probably ever remain one of the unwritten chapters of history. Yet it is possible, within certain limits, to reconstruct the situation and to determine the problems with which man had to deal, as well as the experience which he could bring to bear upon the same.

Hunting tribes had long been familiar with the use of fire in shaping weapons, and had learned the effect of heat upon the various stones upon which they worked. This experience and that gained in firing pottery, especially such as contained bits of shells, united with experience in the use of blowguns, formed a substructure upon which it was possible to build the art of metallurgy.

Whether the first experience in reducing ores came about through the presence of such ore in the camp-fire, or whether it was the result of some great conflagration in a region abounding in ore, is not a matter of any great consequence. The significant fact is that the result of the accident was noted, and that the effort was made to produce consciously a product similar to that which was the result of an accident. The name of the genius who made the discovery is not known. The stories that people who have passed through this stage tell of him indicate his superiority, the significance of his work, and his place in the society in which he lived.

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Tradition points to the fact that the art of metal-working was founded by a warrior disabled in battle, who, no longer able to engage in the more strenuous conflict of war, turned his energies in another direction. It is very probable that such a man, chafing under his physical weakness and eager to avail himself of any opportunity to make good his lost strength, would be quicker to recognize the significance of an accidental process of smelting ore than one whose energies found expression in a more active life. The problem, presented under these circumstances to a man accustomed to lead, would not be given up without a thorough testing of all available means. The difficulty of the various steps in the process, as well as the significance of the application of the new material in the manufacture of implements and weapons, would unite in causing the founder of this art to guard the process from the public. It cost too much labor, too much thought, to be lightly parted with. Besides, it was a means of support under conditions in which it was impossible to engage in other occupations.

Perhaps it was the secrecy which surrounded the art, as well as the almost magical character of the new implements, that caused strange stories to be told of the early smiths and metal workers. It surely was for the interest of the

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worker who would protect his art to encourage the belief in his supernatural character. The prevalence of such superstitions accounts for the fact that when any one not initiated into the mysteries of the process wished some product of the metal worker's craft, he would approach to a spot some rods away from the workshop and there hang in a conspicuous place a leaf, the shape of the weapon or implement desired, together with a quarter of meat or some other useful object. The fact that a weapon of the desired shape was found the next morning on the spot was accounted for by the magical power of the mysterious man who dwelt in the obscure place, secluded from the gaze of men.

The significance of the use of metals is incalculable. The fact that the process was so difficult and so much more indirect than most industrial processes of the time made it necessary for the people who practiced this art to devote a considerable part of their time to this work alone. When the advantage of the use of metal in place of stone was once perceived, a demand sufficient to enable the workers to devote their whole time to the art was made. This greatly influenced the development of trade, which from this time becomes a more regular feature of life. The use of metals affected agriculture so as to almost revolutionize its methods of work. It was

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no less powerful in its influence on warfare, both offensive and defensive, thus indirectly affecting the location and character of habitations. So powerfully has it influenced the mechanical arts that it is not uncommon to read that they originated in the art of metallurgy. This statement is too extreme, for it ignores the humble efforts of countless workers of the long ages that preceded this discovery, but it serves to emphasize the fact that this art has put into man's hands tools, without which he could never have grappled with the difficulties he has been able to overcome by their use.

TRAVEL, TRADE, AND TRANSPORTATION.

Man has ever been a wanderer. The original stimulus to travel was found in the search for food. If man would gain the fruits of the plant world he had to travel to the favored places in the proper season. Animals came to him, but they also migrated again, and he followed them, utilizing the trails that they made. The birds in their flight suggested that there might be better places beyond; and even the movements of clouds and the heavenly bodies were not without their influence. Man's route was the trail of wild animals, his guides their familiar forms, the stars, currents of wind and water, and his own instincts and experiences. As societies became established

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TRANSPORTATION.
(TRAINING DEPARTMENT, UNIVERSITY OF UTAH.)

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man traveled to attend tribal gatherings. These, although they partook largely of a religious or festive character, actually served to promote trade, which for a long time consisted of the exchange of presents.

The increase in population, which tended more and more to confine people to more restricted territories, and the specialization of tribal industries due to the difference in the distribution of the raw materials of production, tended to foster a more regular exchange. In some cases this took place in the form of tribal visits to the favored spots on the payment of tribute; in other cases temporary markets and fairs were established on neutral territory, or at places that marked a break in transportation. The advantage of this exchange was such as to make it desirable for all to foster it; and so in many places regular markets were allowed, even in hostile territory; and traders, travelers, and carriers were allowed to pass through an enemy's country unmolested.

The need of standards of measurement gave the mind more precise problems with which to deal, and artificial standards were gradually developed to take the place of the natural units that were subject to too great a variation to satisfy the sense of justice that was being developed by trade. The possibility of acquiring the special

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productions of other tribes through trade operated to increase the desires of man. He was no longer satisfied with the necessities of life and such ornaments as he could manufacture by utilizing the resources of his own environment. He began to demand the luxuries of life, and for a long time trade with remote regions consisted chiefly in an exchange of such articles. But it was as true then as now that the luxuries of one age are the necessities of the next; and so it was brought about that the demand for exchange became more sure and steady, and people occupied themselves with improving its technique.

Whether the trade was by sea or by land, it was necessary to consider routes of travel and ways of improving the same; it was necessary to consider the motive power, the vehicle, the devices for attaching the burden; it was necessary to consider means of caring for the comfort of the carriers, and a multitude of problems originating in the various activities concerned in the process of taking the goods from the producer to the consumer.

The activities that cluster about primitive trade, travel, and transportation were significant not only with reference to the development of man's intellect, but with reference to his emotional nature. The satisfaction of human desires now made it necessary to establish sympathetic relations with

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people related by no recognized bonds of fellowship. The contact with strange people at fairs, at the market places, or by means of nomadic trade, broadened the ideas and widened the sympathies. The influence of travel and trade in all time has been to establish and maintain peaceful relations except when it has been necessary to exploit new fields; but even this temporary attitude of hostility is, from the point of view of the trader, a necessary step in establishing wider relations of a peaceful and industrial character.

But while the development of trade tends to unite peoples, for a time at least, it separates individuals.[1] Hospitality gives way to a sense of exact justice which makes the rendering of the most trifling things which humanity would demand a subject of trade.

The growth of commerce develops a new type of man. Each day brings a multitude of problems which must be dispatched with the least possible delay. The similarity of the problems that arise day after day, appearing under particular differences, develops the habit of deciding questions with directness and dispatch. It secures the habit of ready adaptation within certain prescribed limits.

THE CITY-STATE.

The succeeding epochs in the period of house

[1] MONTESQUIEU, *The Spirit of Laws*, Vol. I, p. 365.

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industries differ from those already outlined chiefly in degree. The city-state is merely an expression for that stage of culture in which man in eastern Europe, western Asia, and northern Africa made the conquest of the river-valleys, which previously had defied his efforts to bring them under cultivation because of the inadequacy of his implements and the limitations of his political institutions. The history of the development of the city-state is an account of the growth of a more and more prosperous tribal town or nomadic village which gradually subjugates the less powerful neighboring peoples. It is the history of the transition of these peoples from barbarism to civilization.

The city-state introduced a new principle of rank, and with this a division of operative functions. In its earliest development it failed to recognize the necessity of a "general homogeneity and interdependence of parts and that unification which gives solidarity." It simply sought to compel the outlying subject cities to acknowledge allegiance and to pay tribute. "Gradually," writes Mr. Powell,[1] "the lesson was learned that universal empire can be but transient without the universal adoption of the institutions and religions and even the languages of the conquer-

[1] J. W. POWELL, "From Barbarism to Civilization," *American Anthropologist*, Vol. I, p. 110.

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ors. . . . . Then it was that a new class of nations developed—nations organized for the collection of tribute and the establishment of solidarity. . . . . Sometimes the center was on the Nile, sometimes on the Euphrates, sometimes on the shores of the Mediterranean—and at last conquerors dreamed of being masters of the world."

THE FEUDAL SYSTEM.

What the city-state was to the tribal towns and nomadic villages of the East, feudalism was to those of the West. With the pressure of new populations there arose the need of defending and rendering more habitable the lands already possessed. There was constant danger of attacks from barbarian tribes on every hand. The central governments were too weak to render effective service in the absence of ready means of intercommunication, and the isolated village communities were too weak to act alone. There was need of more concerted action. The small land owners were in need of protection, and the large ones in need of working and fighting men. There were few places of defense and little or no money available for rents and wages. Under these circumstances willing hands erected the great feudal castles to which all might flee in time of danger, and gladly rendered personal service in return for protection.

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The feudal castle with encircling villages beneath its walls represented an enlarged family, and was regulated in much the same way as the patriarchal family of earlier days. Under this régime such skill in special lines was developed that when the time came for emancipation, the workers were ready to take up the free work which characterizes the handicraft period. Feudal industries thus, in a special sense, represent the transition from domestic or house industries to the handicraft system, which characterized the period of town economy.

THE HANDICRAFT SYSTEM, OR THE PERIOD OF TOWN ECONOMY.

The handicraft system of labor arose in western Europe with the use of money, the freeing of the slaves and serfs, the development of commerce, and the rise of the free towns. Services which had been rendered by slaves were now performed by free men. People who no longer had slaves still had the need of service, and under the new conditions they employed the various handicraftsmen to do the work which was paid for in money. "The handicraftsman," writes Professor Bucher, "is distinguished from the wage-worker only in the fact that he possesses all the means of production, and sells for a definite price the finished article which is the product of his own raw material and his own

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incorporated labor, while the wage-worker merely receives a recompense for his labor."[1] The fact that the handicraftsman always worked for the consumer served to place responsibility for the quality of the work.

This period is characterized by a marked differentiation of the activities of producing the raw material from those of manufacturing it into the required form. It is true that these activities had previously been performed by different people, but the different activities had been under the direction of one man who controlled the entire process. Under this régime there was a continual narrowing of the activity belonging to any one craft, and there grew up with the development of the craft-guilds a spirit of "internal bickerings."

During the period of house industries the labor of the individual was significant in relation to the family or clan. Under the system of handicraft labor it was significant in relation to the local market of the community in which the handicraftsman resided. Modes of travel and transportation were such that in respect to the necessaries of life each community had to be self-sufficing. When, upon the application of other than human power to industrial processes, handicraft labor was forced to give way to the factory, and the local market

[1] CARL BUCHER, *Industrial Evolution*, p. 170.

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to the national or international market, it became restricted to a narrower sphere. In that sphere it still performs a distinct social service. "That sphere," writes Professor Bucher, "today is the country, the districts where it still finds the conditions of existence that gave birth to it in the Middle Ages."[1]

During this period there was a remarkable application of wind and water power to industrial processes formerly carried on by human or animal power. This fact, together with the many inventions which were expressions of ways of utilizing these new forces, is significant when considered with reference to the inauguration of free labor.

THE FACTORY SYSTEM, OR THE PERIOD OF NATIONAL ECONOMY.

The factory system arose in response to the use of steam as a motive power. Before steam could be utilized as a motive power it was necessary to invent means of applying it to a given work. At this point science came to the aid of industry and contributed the knowledge by means of which steam could be applied and controlled.

The history of the application of steam to means of travel and transportation is the record

[1] *Industrial Evolution*, p. 211.

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of the change from exploiting the immediate locality in the interests of industry to that of exploiting the remotest regions of the known world. It is a record of the change from the sale of goods at a local market to the sale of them in the great markets of the world. The history of the application of steam to the manufacturing process is the history of the change from the simple handicraft labor with simple tools in the interests of the immediate locality, to the centralized system, which represents the organization of the entire process of production for a national market in the most effective way yet known.

While it is a serious question whether the economy gained through the minute division of labor which separates the skilled from the unskilled, the mechanical from the intellectual, is not at the expense of the workers themselves, it cannot be denied that all classes have received benefits from the introduction of the factory system. The complexity of the social life which has resulted from the use of steam as a motive power has presented problems that baffle the powers of the most acute. Whether they will be settled in this stage or whether they will give way to a new set of problems that will come with the application of a new power is a question for the future.

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The use of electricity or some other power that can easily be transported would certainly operate to check the centralizing tendency brought about by the use of the steam engine. There is little doubt that science will again come to the aid of mankind and afford a solution to many of the vexed social questions by means of promoting the advance of industrial methods.

"The unwillingness to use machinery," writes Mr. Burges, "may perhaps be traced to the teaching of Mr. Ruskin and of the late Mr. Pugin, but then these gentlemen have unfortunately been misunderstood. What they have battled for was the disuse of mechanical means in the production of architectural ornaments. Thus, in a building, they objected to cast leaves in a cornice because one would be exactly like another and because the undercuttings could not be obtained from a mould; but, as far as I can see, they never objected to the proper employment of machinery as a help to either the artist or the workman. In fact, Pugin says in one of his works that had he 'a cathedral to build, one of the first things he would do would be to set up a lathe to turn the smaller columns.'"[1]

A careful study of the various forms of industry that prevail in our own age in various parts of the world, together with the consideration

[1] BURGES, *Art Applied to Industry.*

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of such thoughts as Mr. Mitchell presents in his book entitled *The Past in the Present*, leads one to appreciate the closing words of one of the chapters in Professor Bucher's *Industrial Evolution* where he writes, "For after all, the comforting result of every serious consideration of history is, that no single element of culture which has once entered into the life of men is lost, that even after the hour of its predominance has expired, it continues in some more modest position to co-operate in the realization of the great end in which we all believe, the helping of mankind toward more and more perfect forms of existence."[1]

[1] CARL BUCHER, *Industrial Evolution*, p. 184.

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CHAPTER III.

ORIGINS OF THE ATTITUDES THAT UNDERLIE INDUSTRY.

"If we could obtain an ultimate analysis of what is at work in the world about us, shaping the minds and the destinies of mankind, we would doubtless find there the deeds of all the vanished units of the race, each having a share, great or small, in the human activity of the present moment."[1] The truth which this statement of Professor Shaler's expresses compels one who would understand the attitudes of the child to take into account their origin; for, however closely we focus our attention to the facts of the present, much of their significance escapes if they are not illumined by the light derived from a study of the past activities of the race in which they first took root.

Human nature is too complex to lend itself to precise formulation. In studying the child we may be able to discover attitudes due to physical heredity, those due to social heredity, those due to environment, those due to the interaction of two or more of these, and we may discover types of activity characteristic of the different stages of development; but when we have finished our

[1] N. S. SHALER, *The Individual*, p. 78.

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classification we cannot superimpose it upon any child so as to make it represent his whole nature. It is always necessary to make allowance for individual variation. There is something in each individual that escapes formulation.

It is an accepted truth that those racial activities which are most ancient and most prolonged have had the most potent influence in determining the attitudes of mankind. Attitudes due to such causes appear earliest, and although they may early be overlaid with more complex habits, they remain strong throughout life; and when, as decay sets in, the more complex habits one by one disappear, these native instincts reassert themselves and persist till the last.

There are instincts that have resulted from later racial activities, but their early appearance as well as their permanence is in direct proportion to the remoteness and duration of the activities which produced them. Comparatively recent racial activities certainly operate in determining the attitudes of the child; but they operate not through physical, but through social heredity.

Darwin is a notable example of those scientists who have attempted to explain human emotional attitudes by reference to those of animals. However fruitful such an investigation may be, it seems to promise less for educational purposes

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than investigations along racial lines; for it must be remembered that continuity in emotional attitudes can be explained only on the basis of continuity in biological function. For this reason education must wait upon biological science until the connections needed are established, and even then the use of the materials offered is open to the charge of explaining the more clear by the less clear. Until we know more of the consciousness of animals we are scarcely in a position to make a profitable use of animal psychology in interpreting the activities of the child.

When we attempt to interpret the attitudes of the child in the light of the activities of the race there is more hope of success; for the continuity of the biological function upon which the continuity of emotional attitudes depends is assured. But even here we are liable to error in the interpretation of the conscious states of people living under social conditions so much more simple than our own. The means of rectifying these errors, however, are becoming more and more available through the results of the different methods of research which serve mutually to check one another. The especial value of this method is that it reveals a rich educational significance to attitudes which, from the point of view of our more complex social life, are trivial

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and meaningless. This method of investigation, more than any other, is rich in suggestions of ways of utilizing for educational purposes forces which usually are allowed to expend themselves without becoming the basis of social habits.

The importance of the body in the study of emotional attitudes can scarcely be overrated. It is through the body that heredity acts. Dr. Loeb is authority for the statement that the only traits we know to be due to heredity are the form of the body and the instincts; and he states that for the inheritance of instincts "it is only necessary that the egg contain certain substances — which will determine the different tropisms — and the conditions for producing bilateral symmetry of the embryo."[1] That these substances which determine the different tropisms are the product of remote and long-continued racial activities is now recognized. How the racial activities, through the mediation of these "substances," have resulted in the different tropisms; how these tropisms reveal the continuity of human life from the earliest times to the present; how they have the most *profound significance* for educational purposes, it is the purpose of the following pages to make clear.

Emotional attitudes undoubtedly owe their origin to physiological causes. They are *organic*

[1] JACQUES LOEB, *The Physiology of the Brain*, p. 7.

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strains which may easily be recognized in the case of the coarser emotions. The difficulty in recognizing the organic reverberations in the case of the more refined emotions is on account of the subtlety of the movements involved.

To understand the attitudes of the child we must know the activities that are bound up with them. Knowing, feeling, and willing are bound up with those activities that developed with reference to maintaining the life of the individual and the race. Those activities that have for their object the nourishment of the individual and the perpetuation of the species represent the most fundamental processes in the life of primitive people. That these activities should be accompanied by pleasure is an indication that, in their outcome, they contribute to the welfare of the individual and the race. It seems to be the natural method in organic development to place a premium upon the activity needed to further the normal growth of the individual as well as the species.

Long before man learned to manufacture tools to supplement his feeble strength he exploited his environment for food, which he consumed upon the spot, his hands, his teeth, and his digestive tracts performing, unaided by mechanical means, the functions later lightened by the use of tools and mechanical devices. Activities with

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reference to the exploitation of environment lie at the very basis of the industrial processes of all times. That the child early manifests such an instinct, and that in some form it continues throughout life, if not atrophied through disuse, is apparent to any one who will observe the habits of the people in any community.

The most ancient activities which have produced this instinct are undoubtedly those of the race during the period preceding the use of tools. When the whole burden of production and consumption was placed upon the body alone, there was need of searching for the most nutritious and easily digested food that the environment could afford. Later, when man's strength was supplemented by the use of weapons, the desire for food and for social approval impelled him to become skilful in the hunt. Those activities of the hunting people that developed alertness with reference to the animal, vegetable, and mineral resources of the environment, that developed fear of that with which man felt himself unable to cope, and courage with reference to difficulties within the possibility of a successful achievement, resulted in the most generic instincts of human kind. Whether the activities of fishing people were grafted upon these instincts, or whether they are as fundamental as those developed in the hunting stage, is not known with

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certainty. Similar habits, with a difference in manifestation to suit the difference in the situations, would result in either case.

While the hunter exploited the various topographical features with reference to the possibilities in satisfying his needs, the fisherman exploited the sea and the coasts. In the pastoral stage this fundamental activity found expression in the domestication of animals, in the search for new pastures, in the protection of the flocks and herds, and especially in aggressive warfare, which is but another form of exploitation of environment for the satisfaction of human needs.

Each succeeding stage of development makes use of this instinct in a way to suit its own needs. Now the exploitation takes the form of discovering the species of plants that will respond most readily to man's care; again it is a search for earth's hidden secrets; at one time it is an attempt to find the most favorable routes of travel or the most advantageous sites for trade; at another it is a search for the choicest soils which can be made subject to man's needs by the use of new instruments and the means of maintaining collective activity. It may be a search in the sky for the means of determining the approach of a new season or a means of guiding the traveler at sea; perhaps it is a series of experiments with

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new materials in order to bring about desirable features accidentally revealed; and sometimes it is an attempt to discover different forms of motive power or the means of applying the same. There is no need of extending the list. To make it complete would be to make an inventory of the initial steps in all forms of progress. That this instinct has sometimes been misdirected, that its influence has sometimes been detrimental to the best interests of society, is not due to any quality that inheres in the instinct itself, but to the fact that it has not been placed properly with reference to the other activities of life without which, except in the most elementary stages of life, it has no *raison d'être*.

Whether we interpret the activities of the earliest people of mid-Pleistocene times, when life was sustained by the acquisition of materials that were consumed upon the spot without the intervention of tools, as giving rise to the instinct to exploit one's environment or to the workmanship instinct depends upon the point of view. Perhaps it would be the wiser plan to regard this period in which production and consumption are not separated in time, as the undifferentiated form out of which both emerge at a later date.

The term workmanship instinct is one that is used somewhat loosely. As used by Professor

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Veblen[1] it is broad enough to include not only those activities involved in *reshaping materials* to suit one's needs, but the whole round of activities to which this lesser activity is related as a part to a larger whole. It is possible that it is due to this use of the term that he has failed to recognize the fact that there was ample room for the development of prowess before the advent of the barbarian form of culture. If it be true, as is accepted by the best authorities in anthropology, that the extinction of the huge creatures that characterized the Pleistocene period was due to man's efforts, and if we can accept the state-

[1] The following quotation from Professor Veblen's article, "The Instinct of Workmanship and the Irksomeness of Labor," published in Vol. IV of the *American Journal of Sociology*, will show the sense in which he uses the term: "A process or method of life, once understood, assimilated in thought works into the scheme of life and becomes a norm of conduct, simply because the thinking, knowing agent is also the acting agent. What is apprehended with facility and is consistent with the process of life and knowledge is thereby apprehended as right and good.

"Where habituation is enforced by selective elimination the acquired proclivity passes from the status of habit to that of aptitude or propensity. It becomes a transmissible trait, and action under its guidance becomes right and good, and the longer and more consistent the selective adaptation through which the aptitude arises the more firmly is the resulting aptitude settled on the race, and the more unquestioned becomes the sanction of the resulting canon of conduct.

"So far as regards his relation to the material means of life, the canon of thought and of conduct which was in this way enforced upon early man was what is here called the instinct of workmanship."

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ment that the pastoral stage did not develop until after the climate of western Europe and its characteristic fauna and flora had become similar to the climate and characteristic fauna and flora that still prevail, except as modified by human action, man of the Pleistocene period, who invented the bow and arrow and all the weapons which precede it, who made use of poison, traps, pitfalls, and countless other devices in his work of exterminating the creatures that impeded his progress, must have been characterized by a spirit of mastery over conditions and a disposition to take the initiative in a greater degree than that for which Professor Veblen[1] gives him credit; and, this being the case, there is less reason to interpret the predatory life of the barbarian stage of culture as an abrupt transition in racial development than there would otherwise be.

[1] THORSTEIN VEBLEN, *Theory of the Leisure Class*, p. 219. "The circumstances of life and the ends of human effort that prevailed before the advent of barbarian culture, shaped human nature and fixed it as regards certain fundamental human traits. And it is to these ancient, generic features that modern men are prone to take back in case of variation from human nature of the hereditary present. The conditions under which men lived in the most primitive stages of associated life that can properly be called human, seem to have been of a peaceful kind; and the character—the temperament and spiritual attitude—of men under these early conditions of environment and institutions seems to have been peaceful and unaggressive, not to say an indolent, cast. For the immediate purpose this peaceable cultural stage may be taken to mark the initial phase of social development."

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For purposes of clearness the use of the term workmanship instinct in this discussion will be limited to those activities which are involved in the reshaping of material for purposes that suit man's needs.

Even if the earliest activities which involved the mere acquisition of food for immediate consumption be waived, there yet remained a long period in this most ancient stage of culture in which a large share of man's energy was expended in constructive activities. When we consider the skill he acquired in working in stone, in bone, in shell, in horn, in wood, in ivory, in textiles, in skins, and in clay, the simplicity of his tools, and the finish of his products; when we consider his insight into the nature of the materials with which he worked, and how he made use of this insight in the various processes of construction in such a way as to respect the limitations and the possibilities of each, as well as the use which the object was to serve; and when we consider the amount of labor that was performed by these people, we are convinced that these activities, which were prolonged for so great a period, are a sufficient basis for the belief that the workmanship instinct is one of the most deep-seated and permanent possessions of mankind.

That the savage dislikes work, in the sense in which we commonly use the term, is true. That

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he accomplished what we would call work, is equally true. What the savage objects to in our work is not the strain of the muscles, but the *strain of attention.* The latter is painful to him because it is not conducive to the welfare of either the individual or the species in the stage of culture in which he lives. Reflection in the savage life is a more expensive form of specialization than the perfected instinct of any animal is to itself and its species. The pain which accompanies intellectual activity can be interpreted only as a warning of nature to proceed no farther in that direction.

The savage does not work according to an intellectually ordered plan. He works in response to his own feeling of need. He finds his problems in the necessities of the situations. They therefore have a real significance for him. They call out a response. At each step of the process he thus feels the emotional glow that accompanies the sense of enlargement of one's personality, the mastery of a new power. As long as the problem appeals to him, as long as there is a store of nervous energy upon which to draw, he continues the work; but when the problem loses its force, when the nervous energy is discharged, he ceases. He is unable to hold himself to his work by an act of the will. His activity is characterized by the same lack of

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patience, the same lack of persistence, as is characteristic of the child when the emotional reactions fail, and by the same patience, the same persistence, which frequently is pushed to the limits of complete physical exhaustion, when the emotional reactions remain strong. So necessary are the emotional reactions to the maintenance of an activity, that in those monotonous activities that made a great demand for sustained physical activity without occupying the mind, the introduction of artificial means of securing emotional reactions was almost universally practiced. In some cases this was accomplished merely by social conversation and jests made possible when several individuals were performing their work in company; the rhythmical character of the automatic movements exercised such an influence upon the social intercourse that it often found expression in song. The feelings thus aroused, it was possible to accomplish easily tasks impossible without such support. In the case of co-operative work the support of rhythm was necessary in order to regulate the co-ordinations as well as to sustain the activity.

The workmanship instinct dominates some stages of development, to be sure, to a greater degree than it does others; but no community can ignore the claims of this instinct for any length of time without serious consequences. To

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such a degree was it the normal expression of each individual in the hunting and fishing stages, and so strong a support did it find in social approval that if, perchance, some individual in the clan failed to provide himself with proper weapons for the hunt, and failed to bring his share of meat to the common meal, he was excluded from participation in the common life of the clan.

While the less strenuous conditions of the pastoral life made less vigorous demands for the products of workmanship, the leisure afforded, together with the more regular supply of nourishing food, made available a larger store of nervous energy than ever before. As more energy was accumulated in the nerve centers than was needed in the serious activities of life, it instinctively sought expression. This expression was naturally along the lines of established co-ordinations, but often without any further object than the activity itself.

The pastoral stage was pre-eminently the play period of the race. On equally good grounds it may be called the period in which art made rapid development. Human culture had not advanced sufficiently to secure a clear differentiation between art and play. Neither was there any well defined boundary between work and play. Now an activity is more like work, in a moment

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it is more like play, and again it is art, or, possibly, all three at the same time.

There was leisure enough at this time for a large amount of playful experimentation, which found expression in the further modification of instinctive activities already adapted to the social needs of the time. In following the herds across the boggy marshes it was desirable to be able to walk on stilts. In leisure hours the shepherds played in such contests. In caring for the flocks among the rocky chasms, the shepherd had to be ready at a moment's notice to leap across a gorge, to climb a precipitous height, or to jump across a mountain torrent. In their leisure hours we find them occupied in leaping, jumping, vaulting, and climbing games with the element of danger added, at times, by the introduction of a blazing fire over which the vault was to be made. On the uplands and grassy plains an animal that began to stray from the herd was brought back by a stone thrown with or without artificial devices. Leisure hours saw the shepherd boys engaged in contests of this kind. The value of these games in securing the power of concentration and the capacity for swift and sure reaction, is incalculable.

Like children of today, the shepherds delighted in many games that were imitative of the actions of the domestic animals. Some of these were

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doubtless related to serious activities, but many, such as the imitation of a cock-fight, appear to be pure play. The representation of stealing sheep from a village by a predatory animal or thief probably had a more utilitarian aspect. The various activities of pastoral life—domesticating the wild animals, watching the flocks, protecting them from animals and predatory tribes, seeking the lost, migrating for change of pasture, driving home the cows, milking, sheep-shearing, washing and picking the wool, carding, spinning, weaving, fulling, and knitting—all found expression in games which afforded recreation or relief from the tedium of a monotonous occupation. Many of these have descended, with little change, as a part of the heritage of all succeeding ages.

The Virginia reel, as is well known, is the survival of a weaving game. Weaving songs which imitate the shooting of the shuttle from side to side, the passage of the woof over and under the threads of the warp, and other related activities, are common. Weaving rhymes and pantomimic dances are to be found in the folklore of almost every people who have practiced this art.

The stage in which we find the pantomimic dance and song is evidently not the earliest stage in the development of these arts. The

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dance is a representation of a serious process. As women became more and more skilful in weaving, their bodily activities were rendered more and more rhythmical. As the worker surrenders herself to the rhythm of the movement there is a tendency for the entire organism to respond to the rhythm, and we thus have a tone rhythm, which accompanies the movement rhythm. Sometimes words are used, but they are often nonsense words, being significant chiefly on account of the support they lend to the bodily movements. It is very probable that mothers made use of these suggestions in teaching their daughters, and that later the activity was represented in play. The survival of such rhymes as the following indicates the ancient habit of sustaining the activity in a monotonous work, as well as the influence of the industrial occupation in the development of poetry and song.

Any one who has ever used a dash churn will have no difficulty in recognizing the rhythmic activity which gave the impulse to this rhyme, which, no doubt, originally was accompanied with song:

CHURNING RHYME.

Come, butter, come; come, butter, come;
Peter stands at the gate waiting for a butter'd cake.
Come, butter, come.

—*Journal of American Folk-Lore*, Vol. VIII, p. 82.

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In this the rhythmic movement of the bark-beaters can be detected:

Sip, sap, say; sip, sap, say;
Lig in a nettle bed while (until) May day.

—*Ibid.*, p. 82.

WOOL-CARDER'S RHYME.

Taary woo', taary woo', taary woo' is all to spin.
Card it well, card it well, card it well ere you begin,
For when carded, row'd, and spun,
Then the work is hofelins (half) done;
But when woven, drest and clean,
It may cleading (clothing) for a queen.

—*Ibid.*, p. 81.

KNITTING RHYME.

Needle to needle, and stitch to stitch,
Pull the old woman out of the ditch.
If you ain't out by the time I'm in,
I'll rap your knuckles with my knitting pin.

—*Ibid.*

All of these rhymes show the effect of the more recent stages of culture; but all had a very early origin, and, doubtless, in connection with industrial processes. Numerous illustrations can readily be found in the folklore of any people. In places not yet dominated by the influence of the factory, it is still possible to gather many songs and rhymes of this character that are still in use. Doubtless, most adults of this country have personal experience in the use of some such device for relieving the drudgery of a monotonous

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occupation of childhood.[1] Where school conditions are flexible enough to permit freedom of expression, it is possible to observe spontaneous manifestations of the use of rhythm in industrial occupations.[2]

Without taking the extreme position that Professor Bucher has taken in *Arbeit und Rhythmus*, we cannot fail to recognize that industry has had a powerful influence in the development of art of all kinds. Just as the musical instruments of the hunting stage were subservient to the needs of the people in regulating the movements in the hunt, and in the dance which was, in many cases, a preparation for or a celebration of the hunt, so those of the pastoral stage were such as would

[1] I well remember hearing my mother as she tried to teach me how to knit, make use of this formula, "Put the needle in, put the thread over, pick it through, and pull it off." Since finding the more interesting rhyme given above, I have wondered if that would have been more successful in my case, and whether I should have been compelled to resort to as many devices as I did in order to hold myself to the monotonous work. The formula had little effect, but on being told that I must do my own knitting, I was able to keep at the work under the combined influence of the whistling cold wind, the sound of the spinning-wheel, which, together with the wind, in some way suggested the possibility of freezing, and such a regular tying of knots in the yarn at intervals of about four inches as would make it evident that I had made some progress when I came to a knot.

[2] During this year I have observed in the laboratory of the Department of Education of the University of Chicago many instances of this kind. Children of six years, while modelling in clay, spontaneously express themselves in rhythmic parallelism.

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facilitate the activities of the shepherd during his hours of work or afford him pleasure during his leisure hours. The development of the horn is closely bound up with the needs of pastoral people in giving a signal of alarm when watching the flocks. In time of war the desire to communicate more precise information stimulated the mind to invent instruments which could be used to express the differences. Such instruments were invented in the hunting and fishing stages in connection with the co-operative activities of those times, and were still further developed during the pastoral period. In so far as the conditions of life in the pastoral stage

On finishing modelling a chicken in clay, a little boy, apparently without thinking of any one in the group, said:

Run away little chick,
Run home, home, home.

The following tendency toward rhythmic form was observed in a lesson in co-operative composition: "Beyond the plots was the cultivated land. Outside the cultivated land were broad strips of pasture land. Beyond this was woodland."

A group of children, aged nine years, when polishing pen trays that they had made, spontaneously began to recount their experience in the earlier, less interesting processes. As they continued the monotonous movement of rubbing in the wax, a girl said that she was washing her baby's face. A boy rejoined that he was getting his little boy ready for school. The suggested images furnished an emotional reaction which seemed to afford the children much satisfaction, and probably were quite similar in effect to that of the conversation and jests of primitive people when engaged in individual work in the company of others.

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afforded freedom to the individual to express his thoughts and feelings for the sake of the pleasure in the activity itself, poetry and music were freed from the necessities of industrial occupations; but because nature places a premium upon the co-ordinations necessary to maintain the necessary activities of life, and because of the need of being ready for an emergency, the art and play activities of the period are along the lines marked out by the industrial activities of the race.

The problems presented by the agricultural life were so much more complex, and the end was so much farther removed, that there was difficulty in fixing the attention to the problem; the reflexes were lost and the emotional reaction was not secured. It was impossible under these conditions for the worker to continue the activity for its own sake. Interest, if secured, had to come through the perception of the relation of the activity to a desired end, or through the realization of the moral and ethical ideas involved. Where free labor prevailed there arose in response to this need a series of festivals, partaking more or less of a religious character, marking each important phase of the whole round of activities, from the clearing of the ground to the harvesting and storing of the crops. In this way attention was fixed, and the needed response secured.

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It is very probable that many who shared in these festivities acted in response to the immediate stimulus of the occasion without thought of the more distant end; yet the importance that the harvest festival assumed as marking the culmination of the entire activity served to fix attention upon the end, while the whole series gradually exercised an educative influence far beyond the immediate utilitarian need.

The festive character of many agricultural activities has been maintained until within recent times, when the introduction of more complicated machinery has so lightened the burdens that it is no longer necessary to rely upon such means of support. The distaste for agricultural life which is so common among young people is largely due at present not so much to the work itself, as to the fact that in the separation of industrial processes from festivals the emotional element of the latter, instead of becoming translated into an art interest, has, in too many cases, suffered atrophy from disuse.

While tribes in which free labor prevailed were solving their labor problems, as just stated, other tribes, particularly those shepherd tribes that were being compelled to take up agriculture on account of the pressure of new populations upon lands that had already reached their limit in supplying the needs of pastoral people, were

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working out the solution of their problems in a different way. Accustomed to the easy life of the pastoral people, which afforded the emotional reactions of art and play as well as the stronger ones of war, it was not strange that they preferred it to the settled agricultural life. But it was necessary to till the soil; so they preserved the lives of captives in war and required them to render assistance in the work of cultivating the land.

In the early stages of slavery there was little difference between the position of master and slave. Both did the same kind of work. With the increase in the number of slaves and in the property of the master it became necessary to organize the slave labor in gangs with overseers. Labor thus became compulsory, and disgrace was attached to the unfortunate members of society who became the victims of a stronger power. Society was cleft in twain, and the chasm has not yet been completely bridged. From this time labor became distasteful to the leisure class not so much on its own account, as because of its associations with an inferior class and with domesticated animals. It was conceived as requiring little intelligence. It became irksome to the slave because the problem was external to his own interests and needs. He was no longer free to choose his problems or to control the

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conditions under which he carried on his work. Deprived of the conditions for attention, the organism failed to respond, and the emotional reactions were thus lost.

Succeeding stages of culture have tended to perpetuate the distinction between the leisure and the industrial classes first drawn in the pastoral and agricultural stages. Labor, which at first was a free manifestation of the whole being and the part of each member of society, came to be a forced expression of muscular movement of certain members of society. As society became more and more fixed in castes, labor of certain kinds was conceived not merely as *ignoble*, but as *wrong*, and a *taboo* was placed on many forms of activity.

The freeing of the slaves and serfs in the latter part of the Middle Ages helped to restore normal conditions of labor. But the long ages of servitude had done much to overlay the primitive instincts that underlie industrial processes with such habits of submission and indifference that it was not possible for them to reassert themselves in their native vigor for some time. Nor have they been able to accomplish this work during ages that have succeeded. Although the removal of external restrictions witnessed a remarkable manifestation of the inventive spirit in the application of wind and water power to

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industrial processes, the breaking up of the process of production into lesser activities, and the assignment of each division to some particular craft, has, in a measure, counteracted the advance movement, which was taking place at this time. The handicraft worker, deprived of the rich, broad experience afforded by the free house industries of the earlier period, when each individual carried on the whole round of activities from the search for the raw material to the consumption of the finished product, developed special skill at the expense of an all-round experience. Yet in spite of this the handicraftsman, as compared with the factory laborer of today, had considerable range for the exercise of his ability. Handicraft labor, so long as it was treated in an artistic spirit, reacted in a wholesome way upon the worker, who became more intelligent, more interested in his work, and consequently happier. The direct relation which was maintained between the producer and consumer at this time served to maintain ethical relations in the industrial activities of the period.

The application of simple machinery to the various manufacturing processes during the eleventh, twelfth, and thirteenth centuries involved an advance in the organization and division of labor. Work, which heretofore had in most cases been a personal occupation, now became a

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civic function.[1] The removal of the end of labor added new dignity to the process. It afforded the worker the joy of hope and the consciousness of an enlarged personality. The mind became less occupied with the particular questions of the moment and more interested in questions of general welfare. The spirit of exploitation, which manifested itself in the Crusades, in the establishment of great commercial companies, and in the exploration of the New World, reacted upon society and thus created a demand for more powerful motive forces and more adequate means of application than ever before. The development of science in modern times is largely a response to this demand.

Industry, enriched by the contributions of science, becomes more and more complex. The end becomes farther and farther removed. The worker, no longer being able to perceive the whole process of production, has need of a greater consciousness of collective life than ever before. His activity is no longer a personal occupation that brings him honor as in the period of house-industries, nor a civic function, the actions and interactions of which are within the range of his perception, as in the period of handicraft labor, but a social function in a national if not a cosmopolitan society.

[1] AUGUST COMTE, *Positive Polity*, Vol. III, p. 413.

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That the welfare of the workers has been lost sight of in the excitement attending such stupendous changes, is not strange. The balance has become lost between the character of the machine and motive power on the one hand, and the intellectual and moral condition of the worker on the other. To restore this balance it is necessary to parallel the advance in the character of the machinery and the motive power by an improvement in the intellectual and spiritual condition of the worker. He must be able to perceive the relation of the small part of the work which he undertakes to the entire process from its earliest to its latest stages. He must have such a sense of responsibility as will enable him to have as great regard for the character of the work that he produces for a foreign market, as for that produced for a consumer in the immediate neighborhood where he is well known. In short, the industrial development that has advanced from being a function of the household to that of the city, and finally to that of the nation and nations of the earth, needs to be paralleled by an enlargement of social consciousness from the personal, through the municipal, to such a consciousness as recognizes the brotherhood of all men. Not until this consciousness is aroused will it be possible for the problem, in its entirety, to be present in the mind of the

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individual worker. Only when it is thus present, only when labor is a voluntary expression, is the full moral value of the act secured.

In so far as the development of industry has made a separation between industry and art; in so far as the substitution of machinery for hand labor has resulted in the decline of the festival in connection with the more laborious forms of work, there is need of some more adequate provision for the satisfaction of the emotions than is found in the work itself. Just as the intellect needs the illumination that comes from the contributions of science, so the emotions need the sustaining and socializing power of art. The recognition of this fact is the root of the more recent advance in municipal government, and it promises much for the future of the public schools.

Such are some of the origins of the attitudes of the child toward activity. In the beginning, when societies were simple and unstable, physical heredity was the most potent factor in determining the attitude, although it was always modified by the exigencies of the natural and social environment. With the growth of more complex societies social heredity, in the form of traditions, customs, and habits of conduct, plays a more and more important part in forming the attitudes of mind through the agency of social approval. In proportion as activities modified

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by social standards are remote and long continued are they transmuted into psychical attitudes. So in the child of today there is present not merely the original psychical attitude of the most remote period, but such attitudes reduced and embodied in new and more complicated co-ordinations. The more recent modifications of racial activities operate in society today, not through physical heredity, but through social heredity. Society in each age offers a premium of approval on the activity that is deemed at the time most necessary.

In proportion as society lays hold of instinctive reactions and harnesses them to present social needs, the process of education is promoted. The most serious mistake has been the tendency to ignore the psychical attitudes of the child by imposing upon him the highly organized products of present social life. It is beginning to be more generally recognized, however, that education, to be vital, must be grounded deep in physical heredity, and to be of real social service, must be guided and refined in the light of our highest social ideals. The natural emotional reactions are fixed, and we need not expect any fundamental change. It is the part of wisdom to build upon this sure foundation rather than to seek one among the shifting sands of more recent times. The achievements of recent civilization are of

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value not in determining the foundation, but in fashioning the structure that is reared upon it.

Because the life of the child, with reference to that of the adult, is an embryonic life; because it is the period for the formation rather than for the serious use of co-ordinations, with reference to adult life it is a period of preparation. But however valuable such an idea may be to the adult in the consideration of educational questions, it offers no adequate motive to the child. Not until the mind is able to conceive of an end and the relation of the successive steps in the means to this end, can the idea of the serious work of the future have any direct influence in shaping the motives of the child. Not until this power is more fully developed than we find it in the period of childhood can it be relied upon to such a degree as to be an important factor in determining the attitude of the child. The child lives in the present. He must find his satisfaction in an immediate way. His pleasurable emotions are bound up with his instinctive reactions. Because these reactions have been marked out by the serious activities of the race in its first steps in human progress, because they represent the processes of modern civilization in their most rudimentary forms, they serve to present the educational *opportunity* for establishing helpful relations between the life of the past and that of the

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present. By making use of these instinctive reactions it is possible to make a gradual transition from the dramatic and play interests of the child to the more serious interests of the adult.

Although childhood has not yet been studied carefully enough so that it is possible to know with scientific accuracy the best time to lay hold of each of the various emotional reactions, enough is known to make it no longer justifiable to confine education to formulated intellectual conceptions that have no meaning apart from the process of which they form but one of the less important phases. It is now evident to thoughtful people who have given attention to these questions, that if we would develop the powers of the child, we must utilize and refine those instinctive reactions that are seeking expression, and that, if we would cultivate in him a social consciousness to a degree sufficient to enable him to live an ethical life in a complex social system, we must furnish him the means of participating in the more fundamental processes of life to such a degree as to afford him a measuring unit by means of which he can interpret materials which are presented to him in less direct ways. Only in this way is it possible for the child to appreciate the significance of different activities and their relative place in the organization of society.

The fact that few of the child's activities under

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ordinary conditions result in products of commercial value favors, rather than obstructs, the educational process. There is less inclination on the part of society to withdraw the child from the more direct educational influences than would otherwise be the case. This fact operates also in determining what forms the activity may take.

The demand for the completion of a situation is characteristic of the mind in all stages of development, but it takes less to complete it in some stages than in others. For this reason the earlier activities of children along industrial lines comprehend a much shorter circuit than the later. While the processes of production and consumption which represent the complete situation—the entire circuit—may be so simple in the kindergarten as to be scarcely distinguishable from each other, the process grows more and more complex until, in the later years of childhood, it represents a comprehensive view of the typical phases of the more complex industrial processes.

In so far as the marginal difference between the child's interests and his power to satisfy them in a real way presents a stimulus that retains its power to the end, real construction finds its place as an instrument in education. To deprive the child of the opportunity to construct objects of real utility would be to remove certain wholesome limits, which are quite neces-

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sary in order that he may learn to make his adjustments in the world in which he lives. To confine his activity to such processes would be to seriously limit his development.

Interest and the power to do, seldom or never form an equation. Where interest is greatly in excess illustration, rather than real construction, finds its place. The illustration may be of the constructive type, but it differs from it in being intended chiefly to satisfy the demand for a rich imagery rather than to serve any direct utilitarian purpose. Such a situation presents a favorable opportunity for the development of technique. There is a normal motive for it at this time. The time devoted to technique under such circumstances depends upon the time the child is able to keep in view the relation between the technical work and the whole of which it is merely a phase.

In so far as the completion of the situation requires the child to exploit his own environment in the search for real or illustrative materials of industrial processes, observation and simple experimentation find their place. In so far as it requires the modification of old habits to new purposes in the process of manufacture, experimentation finds its place. In so far as it requires a recognition of the satisfaction that comes with the consumption of the results of

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production, occasions which provide for this need, such as social entertainments and exhibitions, find their place as a supplement to the more regular demands of the home and the school.

With the child, as with the race, the pleasure that comes from the direct exercise of bodily activities becomes more and more subordinate to that which comes from the augmentation or transformation of muscular power through the use of tools, and later to that which springs from the substitution of animal or physical and chemical forces. During this process there is an increasing demand for intellectual activity, which, by its effectiveness in substituting other forces than those of the human body in the processes of industry, secures more and more favorable conditions for a freer expression of the emotions than was possible when bodily activity was so largely subservient to industrial needs. At a later stage the intellect acquires freedom in the same way. The freeing of the emotions manifests itself in art, while the freeing of the intellect manifests itself in science. Both were originally bound up in the industrial process, both are conditioned by it for a long period, and both separate themselves for a time from this process only to return again to give and to receive fresh impulse to a higher activity.

If the increase in power is not accompanied by

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the enlargement of social consciousness, it is apt to manifest itself in a dominating or competitive spirit. If, however, the socializing process proceeds in harmony with the increasing power and means of control, the force which would otherwise express itself in a competitive way manifests itself in co-operation. The transformation of power from the purely competitive to the co-operative form takes rise in the need of greater force than the individual can produce or in an application of force that is possible only with the combined action of several persons. By means of rhythm people learn to work together and in so doing become conscious of the value of co-operative action within certain limits. How these limits are gradually extended so as to include larger and larger groups, how purely commercial relations established between groups lead to the recognition of helpful social relations, how the application of new forces by more and more highly complicated machinery makes the recognition of national and international relations necessary—these are questions that are significant to society; and because they are significant to society they are of vital importance in education. The development of the spirit of co-operation does not imply a disuse of the spirit of conflict. The instinct which underlies this spirit was developed so early and during

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such a long period that, do what we may, it will abide as one of our most permanent possessions.[1] It means, rather, a gradual refining of the method of conflict and a restriction of it to fields that are legitimate with reference to the other interests of community life.

The original impulse to manual training came from the house industries, not from the handicrafts.[2] As a mode of production it is not desirable to perpetuate either except within certain limits. As a means of education there seems to be nothing so well suited to bring about an adjustment between the attitudes of the child and the later differentiated subjects of knowledge, which each individual needs to appropriate, as the house industries.[3] The difference between the house

[1] W. I. THOMAS, "The Gaming Instinct," *American Journal of Sociology*, Vol. VI, p. 750.

[2] CARL BUCHER, *Industrial Evolution*, p. 155.

[3] Such statements as the following from GEORGE H. BRYANT, in the *Manual Training Magazine*, July, 1901, p. 205, fail to distinguish between the educational process and the final result, as well as between the emotional attitudes of the child and those of the adult. It is probable that there will be much confusion in thought along these lines until we distinguish more carefully between the meaning of utility to the adult and to the child, as well as between the social and psychological needs of the different periods of life. Mr. Bryant writes: "No tool or process should be retained in a course after its general use in the mechanical world has passed. Such courses, like the shops employing the obsolete methods, soon become 'back numbers.' Such an obsolete exercise or process may have a certain 'disciplinary value,' or use as a practice piece; but mere disciplinary exercises, without practical application, should have no more place in a school-

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industries and the handicrafts is this: the house industries introduce the child in a vital way to a great number of materials and afford him activity in a great variety of processes. The handicrafts require a concentration of attention upon some one form of production and a mastery of that. The house industries are significant in their fitness to present situations for the breaking up of instincts into a great variety of combinations. The handicrafts, on the other hand, are significant in their tendency to narrow the range of interests and fix habits, which are broken up with difficulty in later years.

The handicrafts and machinery labor have a place in elementary education, but it is a different one from that of the house industries. The house industries correspond to the many-sided interests and activities of the child that can be most fruitfully cultivated in the early years. The handicraft and factory systems correspond, rather, to the differentiation that begins to take place in interests during the later years of childhood, and should be so treated as to preserve for the child the view of the essential factors in the complete situation. It is here that education begins to make more vigorous demands upon both science and art.

shop course nowadays than in arithmetic or grammar. The same or sufficient discipline can be obtained with infinitely greater stimulus by a problem having a direct practical bearing."

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CHAPTER IV.

PRACTICAL APPLICATIONS.

GUIDING PRINCIPLES.

At the beginning of the preceding chapter we had occasion to state the principles upon which the continuity of psychical attitudes depends. We there stated that continuity in psychical attitudes depends upon continuity in biological function, and concluded that, for educational purposes at least, little is to be gained at present by the study of animal activities. It was further stated that even though continuity in biological functions were established, until we know more of the states of consciousness of animals, the method of interpreting the activities of the child by those of the animal would be to still further complicate the question, because we are more familiar with the child than with the animal. In the case of explaining the attitudes of the child by those of primitive people we found that it is possible to make the biological connection, and that the inaccuracies resulting from the failure to interpret the conscious states of the savage can be rectified by the results of other methods of study. We stated also that those activities which are most remote and most prolonged are

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most permanent in their effect upon the instinctive reactions of all times, and that later activities, in so far as they affect the psychical attitudes, appear later in the development of the individual and are less permanent.

We found that those attitudes that represent the emotional reactions of organic strains undergone in the serious activities of primitive people have not been transmitted unchanged, but have suffered reduction and become incorporated in new co-ordinations through the influence of succeeding activities. They appear in the child today as play-impulses, which only in an idealized way represent the serious activities of industrial life.

We also have considered briefly the situation in which man was placed in the successive periods, his equipment, the character of his problems, and his manner of response. We have seen how in these as in the attitudes themselves there has been a gradual change from the simple to the more and more complex.

We have now to consider what the guiding principles are with reference to the application of the results of this study to the practical work in the different stages of development in the elementary-school period. Keeping in mind the changes in the psychical attitudes as well as those in the natural and social environment, we ought

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to be able to separate from the tangled web in a particular situation those factors that are due to the special age and those that are characteristic of all time. We ought to be able to separate the factors in a given activity that are due to the operation of temporary conditions in the natural or social environment from those that are due to the permanent forces of the environment or to the organism itself. Unless we are able to distinguish the transient from the permanent factors in experience, we are scarcely in a position to utilize the stores that the past has to yield.

Whatever activity we consider, of whatever age, if it be a significant one we find that it is because of its relation to its natural and social environment. Any activity is what it is largely because of the natural and social environment in which it is placed. History is full of records of abortive inventions, which were such not because of the thought in the mind of the inventor, but because there was not present a social need, or because there was not present the material by means of which the thought could secure adequate expression. It was not an accident that the mariner's compass, gunpowder, and the printing press appeared when they did. Neither was it an accident that the pyramids were erected in regions abounding with limestone and syenite, or that sculpture developed so remarkably in the

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region containing the whitest, finest, and richest marble quarries in the world. The permanent element in all these activities is the fact that the activity is directly related to the natural and social environment of the age and not to that of some other place or time.

Let us apply this truth to the education of the child. How are we to make sure that the child's activities are with reference to his own environment? The question of natural environment presents no serious difficulty; what constitutes the child's social environment is a question that the American people have not yet settled. That it has been rapidly extended in the past two decades is very apparent; that it will gradually be simplified in the future is probable. We would not, like Rousseau, remove the child from almost all social influences, but we would guard him from the highly artificial stimuli of our complex social life. To present the child with such complex stimuli at the stage when he naturally responds in a simple and direct way, is to force upon him prematurely a complex reaction. It is a question of premature specialization. The *type* of the child's social relations may be sought in his spontaneous activities and in the typical activities of the earlier stages of culture. The particular manifestation of this type must be determined not by the past, nor by the standards

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of adult life, but by the social needs of the child of today.

It must not be forgotten that that which satisfies the child's need of play is as much the satisfaction of his social need as that which satisfies a serious need in the life of an adult. The demand that the activity be related to the social needs of the child must then be interpreted so as to afford ample room for the satisfaction of the need of play.

Taking into consideration the transformations that have taken place with reference to the psychical attitudes, we may conclude that with reference to the child we have separated the transient from the permanent when we have selected from an experience that which appeals to the emotional attitude most in need of development, and when we have provided an opportunity for the child to make use of his environment in responding to the stimulus. When the child manifests an attitude corresponding to the activities of a simpler stage of life, if he be encouraged to exploit his environment with reference to satisfying this dominant instinct, and if the experience thus gained be enriched by the race experience to which it is a parallel, he is making vital relations with his own natural environment and constructing such a social one as corresponds to his power of appreciation. Atten-

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tion directed to normal ways of utilizing the energies of the child will prevent an immense amount of mischief, which is the result of unemployed or misdirected energy. The statement that the child's activities should be with reference to his own natural environment should not be construed to mean that the world beyond the child's sense perception should be closed to him, but rather that he utilize his own environment in his attempt to understand that which is beyond the range of his senses. The form of the problem and its general character persist; the content is subject to change.

The socializing power that comes from a well-directed study of the past is secured chiefly through the recognition of the principle that in the adaptation of the materials of the past such a condensation of the experience of ages should be telescoped into the activities of a few hours as corresponds to the parallel changes in the child's attitudes with reference to their more instinctive origin. To attempt to carry the child through the actual stages of racial development in a minute way would be to arrest development; the child represents something of the present as well as of the past. Although the child enters sympathetically into the problems of primitive life, he never for a moment identifies himself with the people except in a dramatic way. He is looking

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down from above, and he knows it. At the same time he is leading up to a fuller realization of forces in his own life which, hitherto, have been unrelated.

It is important also in making use of the materials of the past that we distinguish between the experiences of free and slave peoples. While it is instructive to discover how slavery arose, and under what conditions it developed, it is surely not the part of wisdom to attempt to perpetuate such conditions; we should rather seek to avoid them.

In seeking in the past for typical activities to be adapted to educational purposes it is important to bear in mind that while the child is still in the stage of undeveloped technique, a highly educative value may be secured by exercise in the simple house industries, if only the simple technical processes involved are applied "in the simplest and at the same time most comprehensive manner."[1] As the child develops in technical skill he may be introduced to more and more complicated tools, but at no time should the complexity of the technique that is represented by the tool be such as to destroy the relation that should always be preserved between the skill of the child and the character of his tools.

[1] CARL BUCHER, *Industrial Evolution*, p. 42.

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With these more general statements regarding the limits within which racial experiences may be utilized for educational ends, let us pass to the more practical consideration of the character of the materials adapted to the psychical attitudes of the successive stages of child life.

STAGE OF INFANCY.

The most fundamental steps in the establishment of community life have ever been those of establishing helpful relations with one's environment. How to come into sympathetic relations with the earth and its raw materials, how to establish helpful relations with neighboring peoples, are problems that all people who have advanced have had to face. The solutions of these problems furnish the foundation upon which civilization rests. Just because the scientific interests are not yet differentiated from the industrial, because the intellectual interests are not differentiated from the practical, because the emotional element is not yet free to express itself on its own account, there is no separation between industry, science, and art. Those interests which correspond most closely to the scientific interest find in industry their excuse for being; those which correspond most closely to the later differentiated art interests are present at this time as a quality corresponding to an attitude of mind.

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If by the scientific attitude is meant the desire to discover facts and to verify principles, it does not appear before the period of adolescence, and probably not until that stage is well advanced. If, however, the scientific attitude is construed as meaning a phase of experience that is not freed from the social and practical needs of the child, yet, when taken in such relations, has a profound significance, the case is different.

The first efforts of the infant are with reference to his environment. And although he is confined by the necessities of the case to a limited space, and obliged to use his hands to assist in locomotion, no one doubts the thoroughness of his exploitation. Like primeval man, who has not yet developed free hands and an erect posture, he is unable to use tools. His only tools are in his body, and he is just beginning to learn their use. The motive power at his disposal is furnished by his own muscles. His first activities are largely instinctive; but he soon begins the process of experimentation by means of which the inherited instincts, so well fitted to serve a few needs, become broken up so as to meet the demands of many. The achievements of early infancy, which lasts until about the age of two and one-half years, are the co-ordination of the reflexes connected with the various senses, a ready response to sense stimuli, the acquisition of milk-teeth which affect

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the problem of nutrition, and the erect posture which relieves the hands from the function of locomotion and sets them free for higher purposes.

During the period of later infancy,[1] which lasts from two and a half years until seven or eight, the child begins to exploit an environment which takes in not only the home and its immediate surroundings, but the school and the immediate neighborhood. The tendency to run away which has been noticed in the third year is an expression of the disposition to explore the environment.

Later infancy is pre-eminently the period of play, and it is for the satisfaction of the play instincts that the environment is exploited. The child's interest in a snowstorm is largely bound up with the pleasurable experiences of sight and touch which he experiences if allowed to be out of doors while it is snowing; or it may be the anticipation of the delight of playing snowball, making a snow man, or rolling and tumbling in the snow without any further object than the pleasure the activity affords. The changing phenomena of the seasons are significant to the child of this period chiefly because of their relation to

[1] The classifications of the stages of psychical development followed is that given by Professor Dewey in his syllabus of *Educational Psychology*, pp. 8-10.

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"Later Infancy is Pre-eminently the Play Period" (p. 106).
(Training Department, University of Utah.)

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his play. To lay hold of this interest, to direct it so that it will lead to useful ends, to enrich the narrow personal experience by that of the group, and to supplement both by stories of animals and of people whose activities are conditioned by the phenomenon under consideration at the time, is the part of parents and teachers. The impulse to utilize the results of the more striking natural phenomena is so strong that it will assert itself in spite of repressive measures. Observation seems to indicate that this is not true with respect to the utilization of the more constant elements of environment.

The development of the factory system, by crowding people into large cities, has tended to deprive many children of the opportunity to come into close contact with nature. But even under more favorable conditions there has been a tendency in the home, as well as in the school, to superimpose upon the child empty reproductions of complex social life. This is nowhere more clearly illustrated than in the domain of children's amusements. The marvelous increase in the number and variety of children's toys is a subject worthy of more serious attention than it has yet received. Even a superficial observation of these toys indicates that many of them are of such a character as to leave the child comparatively passive. The activity is handed

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over to a mechanism. The child gets his emotional excitement without regard to its legitimate expenditure. The balance between the sensory and motor nerves is destroyed, the organic circuit is broken, the tendency to rely on an external stimulus is fostered. The mere fact that the stimulus calls for so little motor response is sufficient to explain its temporary effect and the constant demand for some new means of stimulation.

Could parents and teachers take even a few minutes a day or a few hours a week to help children to see the possibilities in a pile of sand, an unoccupied piece of ground, the tough grasses and woody fibers growing in the waste places, a neighboring tree, dry-goods boxes, paper and paste, in short, in any of the legitimate materials in the environment of the child, there would be a saving of time for adults and a more normal and happy growth in the child. Such conditions would afford a normal outlet for the constructive instincts, which need nutrition at this period when the hands are first free to serve their needs.

The injurious effect that our highly organized social environment is apt to exert upon the child may be largely nullified if, at this time, the child be supplied with sufficient wholesome nutrition for his impulses that are striving for expression. There is no doubt that the child gets greater

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satisfaction in activities that are normal to his stage of development than in those for which he is not yet ready. But if prevented in any way from realizing himself through normal activities, he inevitably occupies himself with that which cannot fail to harm him because of its lack of adjustment to his needs.

In the earlier part of this period, personal experience is enlarged by participating in the life of the group, and by stories of people and animals under similar situations; in the later part, it may be enriched by leading out from those activities of the child which are a crude imitation of the activities of adults about him, to the activities of people in a similar natural environment — so far as climatic conditions are concerned — but a simpler social environment. Agricultural life, preferably that before the introduction of complicated machinery, and simple village life afford excellent materials for this purpose. On the other hand, experience of this period may be enriched by leading out from the artificial products that are significant to the child, to the people engaged in the preparation and transportation of the same. This makes more vigorous demands upon the child's constructive imagination than the preceding, but it seems to meet a demand on the part of a child of six years for the links that unite him to that

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which is beyond the limits of his sense perception.

Throughout this period the child shows a strong interest in animals and plants. He is interested in some animals because they are his playfellows. It is largely a social interest. He is interested in others because he wants to see what they will do. Seldom, under ordinary conditions, does the interest at this period have any relation to the question of food. The child's interest in animals can be most profitably utilized in home-life on the farm, but even the crowded part of a city can offer something to the child in this respect. It is an easy matter to gather cocoons, and their transformation into moths or butterflies is a wonderful revelation to the little ones who are fortunate enough to see it. Canaries are always of interest to children, who well may be allowed to care for them. Fish, frogs, and other animal forms may be brought into the schoolroom for a time if aquaria are available. An occasional visit of a domestic animal is welcomed by the children. The value of the visits of animal friends depends largely upon the attention given by the teacher and children to the conditions which will provide for the needs of the animals during their stay. To hire a man to do all the work necessary in order to bring an animal into the schoolroom is to deprive the child of the chief value of

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"An Occasional Visit of a Domestic Animal is Welcomed by the Children" (p. 110).
(Miss L. M. Chillingworth, New Haven, Conn.)

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the occurrence. It would seem to be a better plan for the teacher and children to consider the matter together, to decide what animal they should like to have in the room for a few days, to find out what animals are available, how they are living now, what they will need if they come, and what provisions can be made to satisfy these needs. If, after such conferences and investigations as are necessary in order to determine these points, the children are disposed to undertake the responsibilities, they may be given such assistance as may be needed in order to make everything ready. By putting the subject in this light the children readily see the need of doing what is done; and if failure to meet their responsibilities in regard to the care of the animal results in its return to its native environment, they can readily see the justice of the act.

By emphasizing the thought of care and protection in this practical way the child's instincts, which at times lead to cruelty, become tempered by the social forces of present life. His instincts with reference to animal life are recognized sufficiently to give him satisfaction, while social forces operate sufficiently to adapt their expression to the social life of the community in which he lives. These habits are of more importance than the knowledge that he gains, though that may be considerable.

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The child's interest in the plant-world and its products is much more closely related to the food interest than his interest in animals. The country child very early learns where to look for the ripe berries, if he has not already exhausted the crop by prematurely gathering it. He learns where to look for nuts and acorns, where the wintergreens grow, and he finds it convenient to make friendly visits to his neighbors during the watermelon or plum season. His interest in a tree is because of its fruits, because it is a favorable place to put up a swing, because it is so shaped that he can readily climb it, or perhaps because it has a mysterious hollow at its base into which he can poke countless objects.[1] His interest in topographical features of his environment are with reference to his own activities. He likes to climb a high hill, partly because of the effort, partly because of the view afforded, and partly because he likes to run down it in summer and slide down in the winter. The clouds are of interest in so far as they seem to represent processions of strange animals, and the beautiful colors of the sunset are interesting as suggesting

[1] I remember distinctly how my sister and the group of girls to which she belonged kept me and my mates, about six years old, busied during the recesses at school for weeks gathering oak-balls, which they borrowed from us under the name of hens' eggs, and which we afterward found they had poked down such a hole as soon as they got them.

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colors of imaginary dresses. To disregard these instinctive attitudes in dealing with such subjects in the school is to fail to appeal to the whole child. Without exception the interest of the child of this period in environment is with reference to his own activities, and this relation must be recognized in our courses of study and methods of teaching before we strike at the root of the question.

With the use of free hands the child begins to show interest in construction, but his constructions at this time are crude. In a general way, the child of this period corresponds to the stage of racial development in which acquisition of products from the natural resources was but meagerly supplemented by the more distinctly industrial processes. The larger co-ordinations are sufficiently developed to demand expression, but the development of the hand at this time does not warrant the use of many tools. The imperative demands of touch suggest that the first work in constructive lines should afford ample opportunity for the direct contact of the hands with the materials without the intervention of tools. Sand and clay are probably the best plastic materials for this period, but even clay is apt to make too large demands upon the fingers until the sixth year.

It is a significant fact, when considered with

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reference to racial development, that the serious activities that may be used to advantage in the kindergarten, in contrast with those which are largely bound up with the make-believe element, nearly all cluster about the subject of food. Children in the kindergarten take delight in the care of plants; they are interested in cooking simple foods; and if their instinctive efforts, which are so apt to result in "mussing about" when left uncontrolled, are directed with reference to present social conditions, habits may be grafted upon them at this time more easily than at later periods. The same is true of washing dishes, sweeping, dusting, arranging utensils in an orderly way, and other similar activities.

Activities that are related to questions of clothing and shelter find expression in a more imaginary way. This seems to indicate that the child, as well as the race, takes a serious interest in the activities connected with food earlier than in those connected with shelter and clothing. The interest in shelter is best expressed by the child of this period by means of building-blocks which afford freedom of movement and quick results. The adaptation of a dry-goods box to the purpose of a doll's house is suitable for this period, and in its furnishings admits of a variety of activities.

The wisdom of allowing the use of tools in

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"The Adaptation of a Dry-Goods Box to the Purpose of a Doll's House is Suitable for this Period" (p. 114).
(Training Department, University of Utah.)

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shaping wood at this time is a much disputed point. Where they are used the work seems to be justified by the joy that the child takes in the full, free movements that call into play the whole organism. The plane and saw, if adapted in weight and size to the powers of the child, afford greater freedom of movement than work in clay as ordinarily introduced. There seems to be little doubt that the use of hammer and nails should be postponed till the next period, especially since glue serves the purpose so much more readily and is more like the paste that most children are accustomed to use in connection with paper-cutting and cardboard construction. Here again the order of procedure is similar to that of the race, which used pitch, glue, and sinew for ages before nails of any kind were invented.

The earliest manifestation of interest in clothing seems to be associated with the self-exhibitive instinct. The child requires an opportunity to express himself in this way in order to develop normally. The fact that adults recount such early childhood experiences so seldom is partly accounted for by the fact that the instinct is one of the most permanent ones we possess. Doubtless all people can recount many experiences of this kind that they have never told to any one. Just as the savage enlarged his personality by the use of feathers and paint, so we all

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from our earliest years are more or less dependent upon similar means in order to realize our full personality. The effect of proper clothing and ornament upon the behavior of the child is very marked.

Our own habits of dress represent activities so far beyond the child's power of execution that the most that he can do at this period, in this connection, is to illustrate the simpler processes. If the first crude attempts at weaving are with reference to making a blanket for a doll's bed, there will be a motive for an otherwise aimless activity. If weaving is attempted it should be with coarse fibers, so as not to make too severe demands upon the activities of the child. Upon the whole it would seem that there should be but little work in the nature of weaving or sewing until the child is at least seven years old. It seems better to let the child's interest in clothing express itself in dressing and undressing dolls, in washing and possibly in ironing these articles of dress, in stringing beads, or in related activities that make little demand for precise co-ordinations.

Up to the sixth year when the object begins to stand out more clearly in the child's mind, when the inner and the outer begin to differentiate, there is no distinction between work and play. To be sure there are differences in activities very early, but if not fettered by external conditions

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the activity is equally free play, whether it serves the purpose of utility in the sense of the adult, whether it serves the purposes of play, as making a doll's house, or whether it is purely imaginary as in the case of dramatic play. It is important that the child get his full share of each variety of play and that its free character be maintained.

One function of dramatic play is its freedom from all limitations. It is an expression of the child's active self. "Play," writes W. T. Harris, "undertakes to reproduce the external semblance of the fact without the causal chain that makes the essential element in it. The farmer mows with a steel scythe and cuts grass. The child mows with a wooden scythe and cuts no grass. He merely 'makes believe' to cut grass."[1]

While dramatic play is the most free of any of the varieties mentioned and is unsurpassed for purposes of enlarging the personality, it is fortunate that the child has at his command a form in direct contrast to it, which subjects him to certain wholesome limits. In a measure such play activities as playing with dolls, and making doll's houses, form an intermediate link between the dramatic play and the free play of work. The interaction of these different forms serves to se-

[1] W. T. HARRIS, "The Place of Geography in Elementary Schools," *The Forum*, Vol. XXXII. p. 539.

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cure a richer experience and a wider range of activities than could be obtained by the use of a more limited range. The chief value of the play of actual work of this period is that it serves as an easy transition to the later stage. When this truth is more fully realized and taken into account in education there will be fewer shocks as the child passes from one stage to another.

What Mr. Mallery writes concerning the pantomime of savages applies equally well to the child at this stage. "Pantomime acts movements, reproduces forms and positions, presents pictures, and manifests emotions with greater realization than any other mode of utterance."[1] The greater reality of this mode of expression is due to its dependence upon the muscular sense, which is the most deep-seated and generic of any of the senses, and the one by which the perceptions of sight and hearing have to be verified. It is by the use of this foundation sense that the child is best able to acquire images. So far as the child's pantomimes and dramatic plays are spontaneous, they have a real significance. It is the purpose of the school, however, to lay hold of these spontaneous plays and freight them with a richer meaning. To allow them to remain in the purely

[1] GARRICK MALLERY, "Gesture Language," *First Report of the Bureau of Ethnology*, p. 281.

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instinctive form is to forego the educational opportunity.

The instinctive expression indicates the type of activity for which the child is ripe. How much content the activity should have, how the child is to gain this content, are important questions at this stage. In cases where the child dramatizes what he has previously performed in a real way, there is no need of attempting to furnish him with a fuller content except as occasion is taken to connect his personal experience with that of others. It does seem worth the while to enrich it in this way. It is one of the means of enlarging the self. In case the child is dramatizing an industrial activity that he has observed it is easy to determine from his attitudes whether the activity has more significance than the stimulation afforded to the physical and emotional nature. If it has not there is need of teaching at this point. If the teaching can be by means of closer observation and conversation with the worker, so much the better; if this plan is not feasible the teaching may be by means of stories, pictures, and the clear presentation of conditions which the child is able to grasp.

The child can be trained to more rhythmical action if he is stimulated by music which suggests the rhythm, but this use of music does not seem to be justified where the purpose is educational.

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The music may stimulate the blood so as to secure a corresponding rhythm in the movement of the muscles quite apart from any idea of the activity represented. It acts somewhat as a hypnotic suggestion. If the child is not able to dramatize an activity in a rhythmical manner without being stimulated and regulated by music supplied by an adult, it is not worth his while to do it. By this it is not meant that music has no place in the child's dramatic activities. It has. When an activity which at first was conscious has become automatic and is used for purposes of *recreation*, music does not interfere with the purpose of the activity. Again, if the child spontaneously develops the music with the activity, it has a natural place. The race parallel is suggestive here, but one must be careful to draw conclusions for the education of the young people in a democratic society from the experience of free people and not from that of slaves.

There are many records of the use of music as the means of sustaining and regulating the activity of free workers, but except in prolonged unrhythmical activities which were accompanied by songs having no other relation to the work than that of relieving its tediousness, the music was the product of labor cries, commands, or the musical sounds of the work tools. It was developed with the work and by the workers. In the

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case of slave labor it was very different. Here the gang of workers took no part in the music. The music was in the hands of a band or a slave driver, and was used to stimulate and control the laborers. The use of music which we sometimes make as a means of controlling activities of children in an external way is not the only instance in which we have failed to discriminate between the conditions of free and slave labor.

The safest course in regard to the educational use of dramatic play seems to be to keep such activity in close connection with the occupations observed or participated in by the children. Should the teacher desire to make use of the occupations of less complex social conditions she will find it worth the while to introduce the process first with actual materials. It is important to distinguish between activities which require co-operative action and those that are the result of individual effort, but as this subject is treated in another place it may be left here without further notice.

STAGE OF TRANSITION FROM INFANCY TO CHILDHOOD.

The eighth year is a period of transition from infancy to childhood. The world is not as objective as it is a little later nor is it so purely subjective as in the preceding stage. This is pre-

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eminently the time for making the transition from play to the more serious activities of childhood. If the emotional attitudes are not transformed during this period there is a serious loss in the vigor of life. The intellectual powers become stronger at this time. This change manifests itself in the interest the child takes in adjusting means to ends, which becomes so strong that the child is able to conceive with clearness situations which previously had little significance for him. He is able to take more factors into account and to establish clearer relations between them.

In the earlier period, the child's personal experience is enriched by experiences of others in an environment quite similar, in most respects, to his own. Now he can take a more difficult step. His power to adjust means to an end in an orderly way suggests the possibility of his beginning to participate in the experience of the race through its successive steps in the conquest of nature and in the upbuilding of society.

It would be possible to find types in contemporary life of all but the lowest stages of culture, and it may be that such types may be used at this time with profit; but this is not the method here suggested. Partly because we are more interested in our own ancestry than in that of other people, partly because more cumulative results

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may be obtained by considering the evolution of one race than by getting more static conceptions of several different ones, partly because we are not so much concerned with the situation at a given stage of culture as we are in the method by which people advanced beyond it, the enrichment of the child's experience in this year is secured by the use of the experience of our own ancestors in the stages of savagery and barbarism. The strong contrasts in the social and natural environment to the child's own are sufficient to appeal to his love of the strange while the likeness to his own is maintained, to a degree, in respect to climatic conditions and certain forms of plant and animal life, as well as in the similarity of race. The opportunities such materials afford for utilizing the emotional attitudes of the child in the service of an all-round growth are numerous.

Although the subject of primitive industries is presented to the child with reference to the life of the people as a whole, and although the interest is in the people rather than in any particular activity or tool, there may be gradually accumulated, if the subject is well planned, a great many sequences illustrating the successive steps along particular lines. When the child has gained sufficient experience in the life of the people as a whole to form a rich background for differentiation, he

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may be encouraged in the act of freeing these sequences from their social setting, not in order to sever their connection with it, but to make this connection more vital. As particular sequences thus become differentiated from the whole mass of experience, and as the child seeks a deeper meaning for each successive step than he may have realized when the subject first attracted his attention, he naturally sets up a return movement of thought to the mass from which the sequence was differentiated. In this way both the original mass and the particular sequence become clarified and enriched. Such activities serve not only as a means of affording the child the emotional satisfaction that comes with the use of a new power, but as a means of reviewing, of organizing the subject in a manner sufficiently definite to answer the needs of the child.

The spontaneous hunting plays so characteristic of several years of child-life may be turned to profit at this time. They suggest not that the child is living or should live today the life of a hunter, but that his instinctive emotional attitudes are nearly the same. The more important difference is this: with the savage the response to the stimulus was a serious activity, with the child it is an idealized one. To be sure, a certain amount of the child's energy finds expression in

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a real way, especially if he lives in the country, but much of it is expressed in some ideal form. Stories that portray contests of primitive people with wild beasts now extinct and the difficulties encountered in finding food and protection appeal to the ordinary child of this period much more forcibly than the ordinary events that take place in his own environment, and he craves for the stimulus that they afford.

It is right here that the mistake may be made of simply gratifying the child's appetite by the use of stories. To do this would be to promote the separation between the objective and the subjective that is beginning to be made. The purpose should rather be at this time to help the child to *feel* if not to *know* the essential unity. For this reason the story of the hunter should be related to the child's out-of-door plays in such a way as to lead him to exploit his natural environment with reference to the needs of the ideal hunting clan in which he has become interested. His environment now takes on a new meaning. In imagination he now regards it as his one source of supply. Nuts, berries, and wild grasses, which have always interested him, now take on a fuller significance. Stones which heretofore have been selected chiefly on the basis of their color or luster now are chosen with reference to their adaptation to a need. For this reason the form

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is important; for the nearer it is to the shape of the desired weapon or implement, the less trouble there will be in shaping it. But the prime consideration in selecting a stone for a cutting implement is to find one that will break with a sharp edge — that will not crumble under a blow.

The child, like the savage, will not make this discovery in his first attempt to make a weapon; and because the child's activity is an idealized reproduction of the real one he may be satisfied without making it at all. This is where he needs to be reinforced by the teacher. She may give the help needed by means of a story or by setting forth the needs of the primitive people more clearly. Unless in some way she helps the child to realize primitive *needs* and guides him in his efforts to utilize his own environment in supplying them, there is no educational value to the work. It is a question of *indulging the instincts.*

The topography and the natural resources of the immediate environment when examined by the child with reference to their adaptation to the needs of a hunting, a fishing, a pastoral, an agricultural, a mining, or a trading people, take on a new meaning. The fact that so much of our territory has already been brought under cultivation makes it difficult for the child to get an adequate image of what it was under primitive conditions. Yet if such opportunities as are available in the

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line of exploitation of environment are used, and if the experience thus gained is supplemented by the use of gesture, pictures, descriptions, drawings, and careful reconstructions of typical areas, so as to show not only the topography, but the character of the vegetation, the very difficulty, instead of offering a real obstacle, is a stimulus to self-activity in the realization of an idea.

By utilizing the materials that are almost universally available to those who are able to recognize them, the child, in the course of a year's work, can realize the special fitness of wooded hills near the river, and probably near its source, for the home of the hunter; banks of the river and the shores of the sea for the home of the fisherman; the uplands and open plains for the home of the shepherd; the fertile river valleys and islands for the home of the farmer; the mountainous places for the home of the miner and metal worker; the harbor, the head of the tide water, the bend of the river, the fork, the fording place, the rapids or falls, the point of the intersection of trails, the defiles, the mountain passes, or any other break in transportation for the center of the trader. He can realize why the hunting, fishing, and pastoral peoples are compelled to lead a migratory life, and why the other forms of culture begin under a nomadic form; he can

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understand better than before why habitations and their furnishings were of such a temporary character.

When the child considers the causes of the migrations of animals he can realize the significance of the change of seasons in relation to the activities of the hunters. When he considers that man made friends with the grass-eating animals only after the most formidable of the beasts of prey had been exterminated, and that the grass-eating animals no longer had to supply food to so large a number of beasts of prey, he can see why the pastoral people could live on a smaller territory than the hunting people. He can see that agriculture, of which he found faint traces among the hunting, fishing, and pastoral people, could not develop until people acquired a settled mode of life. He can appreciate that there must have been strong forces operating to induce men to give up a mode of life to which they were accustomed, a mode of life that afforded freedom from arduous toil, leisure to cultivate the arts, and the strong emotional excitement accompanying cattle-raids and other warlike enterprises. He can see that the weaker and less warlike tribes were forced to seek a place of refuge where they were obliged to depend upon the more systematic cultivation of plants, with which the women of their

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A Lesson In Forethought.
(Stout Manual Training School, Menomonie, Wis.)

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tribes were already familiar; and when people found that it was profitable to cultivate plants, they would be apt to spare the lives of captives in war and make slaves of them. He can see why people needed forethought in order to live by farming, and why so many tribes were obliged to go back to the hunting and fishing stages, or to become slaves of their more intelligent and stronger neighbors.

In this time of conflict the child can readily understand how people living on the hills might defend themselves by means of hill or tree forts; and how those in the valleys and plains might fortify themselves on the marshes, islands, peninsulas, or lakes. He can see how these means of defense arose from the need of protecting the settled homes of agricultural people, or in the need of protecting valuable quarries or mines.

If suitable material is in the hands of the teacher, she can easily lead the children to realize the close relation existing between the prevailing form of industry and the form of government as well as the form of the family. It is probably sufficient when dealing with these questions merely to make the proper groupings of facts, allowing the truth, which is held in solution, to precipitate in its own good time.

The child's interest in metals and certain tools made of them and his intense curiosity in regard

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to such mysterious processes as those by which ores are reduced and metals manufactured, furnish the motive for activities by means of which he may master the rudiments of these arts. His own conjectures regarding the discovery of these processes may be supplemented by accounts derived from the practices of primitive tribes in many localities today. Such processes as mining, crushing, and reducing the ore; building the furnace so as to utilize the wind for a draft, or inventing bellows by means of which the process may be kept under the control of man; adapting the shape of the furnace to the particular situation; introducing fluxes to facilitate the smelting; shaping the metal by means of hammering or by using rude molds constructed for the purpose; providing a means for the escape of gases from the molds; discovering ways of using alloys; taking suggestions from previous experience in the art of cooking in outdoor ovens; making such modifications as are demanded by the special needs of the time and place; and determining the significance of the art in the early stages of its development—all these processes can be brought within the easy comprehension of the child, if approached from the point of view of his own activities.

The child's interest in presents, in the winnings in such games as marbles, and in the various

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forms of barter which are so characteristic of child-life, form a natural approach to the earliest forms of trade. The survival of trading games shows that they meet a permanent want. The child of seven may deal with such questions as how trade originated; why people in the earliest stages depended entirely upon their own efforts in satisfying their needs; how gradually it became customary for clansmen occupying special areas of culture to exchange presents with people of other areas on festive occasions; why such presents were usually exchanged by the leaders of the clans; how the desire to trade was fostered by this practice as well as by the necessities of pastoral and mining life, robbery, the spoils of war, tribute, fines, compensations and winnings in gaming; how trade was retarded by hostile relations, and promoted by peace; why market places were established upon neutral territories; why wandering traders were allowed to pass through an enemy's country unmolested; how the traders carried the news and thus increased the intelligence of the people; how, as trade flourished, there arose the need of more exact modes of measurement; and why permanent market places were established at breaks in transportation.

The development of the subject of trade includes the development of primitive travel and

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transportation on land and on water. The former includes the study of the special costume and carrying devices of man as the human beast of burden; the origin of trails, trading routes, roads, and bridges; the first steps in engineering; the domestication of animals and their use, first as pack animals and later for traction and for riding; the origin and simple steps in the development of the harness; the evolution of the cart, and many activities subsidiary to these processes.

The consideration of primitive travel and transportation by water includes an account of the various swimming devices and aids in floating; the substitution of the method of displacement for the method of flotation; the development of the various forms of rafts, passenger and freight boats used in the periods of savagery and barbarism, as well as the methods of making and propelling the same; and the means of regulating and sustaining the workers in the larger undertakings connected with this life. Many of these questions form a natural part of the subjects outlined above. When this subject is reached it will be well to gather up those experiences that are related to it and use them as the basis of the new work.

When considered in relation to the periods between which it forms the transition, this stage is significant with reference to the tool. In later

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infancy the dominating emotional attitudes and the formed co-ordinations unite in making it the period of the *hand;* in childhood the finer co-ordinations and emotional attitudes make equally strong demands for the *tool.* The child of seven is in an intermediate stage. The finer co-ordinations are beginning to be formed; the child is not satisfied with his former activities, nor is he quite ready for the new. If the dramatic plays of the preceding years have been utilized to their full extent, and if the child has had the privilege of engaging in simple household activities, the transition may be made more easily than if he has been deprived of his full measure of these activities.

In meeting the needs of this transitional period it should be borne in mind that as great an injury can be done to the child by giving him tools that represent a technique far beyond his capacity, as has frequently been done to lower races when put in possession of tools that represent an advanced stage of culture. The harm is done to the savage by greatly increasing his leisure time without any corresponding change in his nature. He is relieved from a wholesome physical strain, that accompanies the use of the simple tool, without undergoing the many *physical*, *intellectual*, and *moral strains* that make the complex tool and its accompanying stage of culture a possibility.

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The result is, almost inevitably, idleness and vice.

While the race parallel must not be applied literally to the case of the child, there is a truth in it which should influence the selection of tools that make up the child's equipment. In short, tools have a deeper significance than is usually attributed to them. There is more than an accidental correspondence between the character of the tool and the stage of development of the individual fitted to use it. In order to make it clear that the attitudes of this period may be utilized in making the transition from the epoch of the *hand* to that of the *tool*, let us consider them with reference to the conditions which gave rise to the origin and development of tools.

Emerson in writing of man in the most primitive stage said, "His body was a chest of tools, but he had not the knack of using them." Writers on anthropological subjects frequently make allusions of this kind.[1] Just as primitive man learned to use the tools in his body in the early stages of his development, just as he made new physical co-ordinations that made possible more complex movements, so the child in the

[1] O. T. MASON, "Primitive Zootechny," *American Anthropologist*, New Series, Vol. I, p. 5; EDWARD CLODD, *Story of Primitive Man*, pp. 14, 15; *Smithsonian Report U. S. National Museum*, 1894, p. 240; *Iconographic Dictionary*, Vol. VI, p. 193.

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"MAKING THE TRANSITION FROM THE EPOCH OF THE HAND TO THAT OF THE TOOL" (p. 134).
(ETHICAL CULTURE SCHOOL, NEW YORK CITY.)

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period of later infancy by means of free play brings into action the various organs of his body and directs them to a multitude of purposes. At the time of making the transition it is especially fitting that his efforts be reinforced by kindred racial experience.

No child of seven needs to be taught the uses of his arms, hands, feet, teeth, and nails. He has used them all numberless times and for various purposes. He knows very well how to strike with the fist, knee, or heel; he knows how to carry burdens on his head, shoulders, back, knees, breast, and arms; he can use his bent finger for a hook; he can scoop with his hands; he can rake with his fingers; he can dig, scratch, and scrape with his finger-nails; he can press and rub with his flat hand; he can drink from the hollow of his hand; he can tread with his feet; he can pierce, cut, grind, and grip with his teeth, and he can grip with the closed hand or hands, or the arm held closely to the body.

On the basis of this universal experience and under the impulse of a need, the child can readily find in his environment the means of improving the tools in his body. He can find suggestions in "nature's workshop." He can find a stone which is harder than his fist and thus gain the use of a more efficient hammer as well as save his fist from the pain attending the

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hard blow; if its rough edges hurt his hand he can wrap the end of it in grass or a bit of skin; he can search till he finds a smooth hammer-stone; if it slips and if its rebound jars his hand he can find relief by using a stone that has a pit on either side which will prevent the thumb and finger from slipping and at the same time prevent the jar. The child will be interested in comparing his own uses of hammers with those of primitive people. In following the life of the hunting clan he will realize that every savage needed a hammer and that he used it for many purposes. He can see that the women would need hammers to break dry wood for the fires, to crush the bones so as to get the marrow, to pound the dry meat into meal for pemmican when they were advanced far enough to practice drying meat, to drive down pegs for setting the tent, and for beating logs so as to loosen the annual layers which they wished to use in making baskets. He can see that the men would need hammers for driving wedges into the logs which they wished to split, for breaking stones in the quarry, for pecking or battering stones so as to shape them into rude implements, and for grinding paints, poisons, and other substances. These various uses will be appreciated only after studying the lives of primitive people for some months; but by dealing with each situation as it

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arises, so as to induce the child to explore his environment and to experiment with materials in the light of his own experience as well as in that of his knowledge of the conditions of the people under consideration, he gradually acquires a measuring unit for a more correct valuation of the social products of his own community. At the same time he is getting a proper respect for the people, who, under less favorable circumstances than our own, laid the foundation upon which our civilization rests.

As the child considers the fitness of the tool for the particular work under consideration he will see that, although one hammer may be used for a variety of purposes, there is need of hammers of different shapes and sizes in order to best accomplish each kind of work. In spite of the difference in shape and size, he will find that they are all alike in requiring a tough, compact, fine-grained stone. As he advances in the work he will discover that some kinds of hammering must be done rapidly, requiring little attention to the direction of the blow, while in other cases the blow is deliberate, the force and the direction of the blow being measured with the greatest care. He cannot advance far in the use of the hammer without facing the problem of hafting, but since this topic is treated in another place it may be omitted here.

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Without going into further details it may be sufficient to note that the child can proceed from the use of his nails and teeth, as cutting implements, to natural objects that are an improvement upon these. In view of the fact that most children possess knives before they go to school, and have seen a variety of knives used for a variety of purposes throughout their short lives, it will be more difficult for them to realize a situation in which they must find something besides a knife to cut with than almost any other situation that may arise in connection with tools. Those who have tried the experiment, however, find that children enjoy situations of this kind; and when they get the conditions of the problem clearly in mind they work perseveringly and with much originality in solving it.

In the presence of knives and other implements made of metal, it would scarcely occur to a child to use a stone to cut with; and deprived of these means, the use of stone will not be apt to be his first solution. He instinctively uses his nails and teeth for the purpose, and if he has the opportunity to see the teeth, tusks, and horns of animals he may get a suggestion from them. If he lives by the seaside he will doubtless think of using a shell, but it will not be long before he strikes upon the use of a sharp stone. While the child would not be satisfied to resign the use of his

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own knife for any length of time, he takes the satisfaction that he gets in play from experimenting with various substances in order to find a material that he can shape so as to make a knife. If he stops short of the use he may fail to discriminate in the selection of material. If not, he can quickly learn the lesson that the savage learned long ago and thus get a practical lesson in mineralogy.

When once the child has made a stone knife without a handle, it will be an interesting study to show how successive improvement may be made in it by varying the method by which the handle is attached. If hafted at the point with a short handle it is a hunting-knife, but if at the side, it becomes a woman's scaling, scraping, or cutting knife. The connection of the woman's knife with the kitchen mincing-knife on the one hand and with the saddler's round-knife on the other, will serve to illustrate to the children that although the material may change, the form and purpose of the knife remain almost the same as they were thousands of years ago.

The evolution of the man's knife is even more interesting, and serves better to show the close dependence of the implement upon the general state of culture. Before man had any weapons it was not safe for him to meet the wild beasts in open combat. They were more powerful than

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he. When he saw the wild beasts he tried to escape from them. This was the *age of fear.* When he learned to make his first rude weapons he found that he could pierce and cut better with the stone knife than with his teeth and nails; he could strike harder blows with a club or a hammer than he could with his heels or fists. Thus armed he got courage to meet the wild beasts in open combat. But it was not safe even then to come into close quarters with some of them; so he lengthened the handle of his knife and thus supplemented his arms by the use of the spear. This was the *age of combat.* Gradually man became so formidable that many of the wild beasts began to fear him. Now it was not man that was afraid; he pursued the animals which fled in fear from his presence. This was the *age of the chase.*

It is interesting to note the interactions between the form of the weapon and the relation of the people to the animals. As the animals became more and more afraid, man was stimulated more and more to invent weapons that could fly faster than they could run. The heavy spear gave way to the dart and the javelin; the throwing-stick was invented in order to increase the force and distance of the weapon hurled. Each invention served either to make such a change in the gripping device as to supplement the

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strength of the fingers and arms, or to improve the character of the working part.

Just how the bow and arrow was invented will probably never be known. The elements which it combines had been in use in different implements for ages. The arrow is but a diffentiation from the primitive hunting-knife or spear. The elastic spring had long been in use in traps. One variety of throwing-stick made use of the bow, but in quite a different way. It is not the use of any one of the principles involved that is so remarkable, but the combination of principles by means of which man was able to co-ordinate mind and body in a most effective manner. The man who hit upon this combination was a genius of a high order. Mr. Wilson, in writing of the significance of the bow and arrow, says: "The bow and arrow was the greatest of all human inventions—greatest in that it marked man's first step in mechanics, greatest in adaptation of means to the end, and as an invented machine it manifested in the most practical and marked manner the intellectual and reasoning power of man and his superiority over the brute creation. It, more than any other weapon, demonstrated the triumph of man over the brute, recognizing the limitations of human physical capacity in contests with his enemies and the capture of his game."[1]

[1] THOMAS WILSON, "The Swastika," *Smithsonian Report of the United States National Museum*, 1894, p. 980.

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Little does the child realize when he plays with his bow and arrow what such a weapon signified to the hunters of long ago. While it is not at all necessary for the child to formulate the facts, it is highly educative for him to get such interactions between his own experience with digging-sticks, spears, knives, javelins, throwing-sticks, elastic-springs, and bows and arrows on the one hand, and the conditions of life among primitive people who made use of these in the successive stages of their development on the other, as will enable him to appreciate the social need out of which each grew. He can readily grasp the idea that each advance, which was significant to the people of the time, was made either by making slight changes in the weapon already in use, or by combining in one form ideas formerly used in different weapons or devices.

Most children are already familiar with the bow and arrow, and before this subject is taken up in class they will have become familiar with spears, darts, and throwing-sticks. It will be interesting to examine a bow and arrow with reference to the simple implements and weapons from which it was derived. For this purpose it is best to use a bow and arrow of the simplest type. The children can readily trace the evolution of the arrow from the first crude hunting-knife and spear. The new idea seems to be the

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bow, but even this is not new. The elastic-spring in the bow had been used in traps and in throwing-sticks. Children are very original in solving such problems, and their contributions to the process of tracing the development of primitive implements and weapons are not to be despised.[1]

The making of the bow and arrow presents the opportunity for acquiring valuable experience. First of all there is the proper selection of material. The child soon learns that any kind of a stick is not suited for a bow. Experience teaches him to select a branch that is both tough and elastic. If he does not know how long a piece to cut for the bow, after he has estimated the length, he may be told how the Indian hunters made the bow eight times the span from the thumb to the little finger of the hunter using it, and the arrow as long as the distance from the armpit to the end of the thumb-nail measured on the inside of the extended arm. This opens up the whole question of measurement and the selection of natural units.

[1] FRANK HAMILTON CUSHING, "The Arrow," *The American Anthropologist*, Vol. VIII, p. 311. "When I was a boy less than ten years of age, my father's hired man, while plowing one day, picked up and threw to me across the furrows a little blue flint arrow-point, saying: 'The Indians made that; it is one of their arrow-heads.' I took it up fearfully, wonderingly, in my hands. It was small, cold, shining, and sharp — perfect in shape. Nothing had ever aroused my interest so much. That little arrow-point decided the purpose and calling of my whole life."

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The child may be satisfied for a time with the unwrought bow; but as he discovers in his play that he can send the arrow to the mark better with some bows than with others, he will discover the need of straightening the stick and removing the inequalities of surface. This need makes it all the more imperative that a good selection be made in the first place, and that it be made some time before the bow is needed, so as to afford sufficient time for the wood to become seasoned. How the savage straightened the stick with his fingers as he held it near the fire; how he steamed it in order to get it ready to bend and shape with his stone knife; how he scraped the rough edges; how he rubbed the stick with reindeer fat to make it more elastic; how he put it away to dry; how later he held it near the fire and rubbed it with bear's oil to make it tough; how when the stick was ready he took the sinew that he had taken from the lower part of the leg of a reindeer and shredded it with his fingers until it was as fine as silk; how he spun it with the palm of his hand on his thigh; how he doubled and twisted the threads until he had cord large enough for a bow-string; how he strung his bow, why he left it unstrung when not in use; why he was careful to keep it dry; how he made a quiver and bow case; how and why he rubbed his bow with oil—all these are subjects of intense inter-

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est and value to the child. They are interesting because they appeal to his instincts; they are valuable because they hold in solution ideas which underlie the science and industry of the present. They serve to make an easy transition between play and the more serious activities of life.

How the shaft was straightened by drawing it through a groove in a soft stone, with or without the use of water and fire; why the feather was split, and the unnecessary parts removed; how it was carefully trimmed and laid upon the shaft to which it was attached by means of glue and sinew; what the function of the feather was supposed to be and what it really was; how the hunter made use of parts of his body for the bearings of the shaft when binding the arrow-head to it with sinew; these, too, are subjects of interest and value.

The child can readily see that in hunting with the simplest kind of an arrow it would be possible for the wounded animal to free itself from the arrow and escape. This condition makes it necessary to think of some way of impeding the progress of the animal or of preventing the withdrawal of the arrow. The perception of this need is sufficient to give significance to the barbs upon the arrow-heads and to the detachable fore-shaft.

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Although the consideration of the methods of making bows and arrows in places where nature has withheld or concealed her gifts may well be postponed to a later year, it is mentioned here in order to show how fruitful in stimulating problems the subject of the bow and arrow is. In dry countries where it is difficult to find much hard wood the hunters are obliged to invent devices for economizing the material. In this way the foreshaft is explained. It is made of hard wood because it is difficult to attach the arrow-head to a pithy twig. The heavy foreshaft makes a good socket for the arrow-head while the lighter wood serves very well for the remaining parts of the shaft.

The making of the bow is not so simple. Yet the manipulation of the materials at hand so as to secure a bow that is sufficiently rigid and flexible has been effected in several ways, doubtless after unnumbered efforts. In some cases two or three horns are united, "the middle piece giving the columnar resistance, the wings putting the arrow to flight."[1] In other cases the effect is secured by using the white or sap wood of the cedar, which is not so brittle as the dry wood. It is removed from the tree so that the outside of the tree will also be the outside of the bow. After

[1] MASON, "The Influence of Environment upon Human Industries and Arts," *Smithsonian Report*, 1895, p. 662.

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scraping, polishing, bending evenly, and carving the ends so as to point back slightly, finely shredded deer's sinew is glued upon the back until it is a semi-cylindrical shape. By anointing it each day while it is drying with deer's marrow the brittleness is taken away.

The problem of the Eskimo hunter is even more difficult. Mr. Mason has described how the difficulty is met in this case. "It is true that he has only brittle driftwood, that glue will not hold in his cold, damp clime, and that materials for arrows are scarce. The result of this is the sinew-backed bow and the harpoon-arrow, together the most complicated and ingenious device ever contrived by savage mind. The bow wood had one virtue, that of rigidity. By an ingenious wrapping of hundreds of feet of fine sinew thread or braid from end to end along the back with half hitches on the limbs, at every danger point the virtue of elasticity is added and you have one of the most quickly responsive implements in the world. The arrow is quite as cleverly conceived, for it pierces its victim, acts as a drag or log to impede its progress, and by its feather as a signal to the hunter in following his victim."[1]

When we consider the difficulties that primitive people had in making the bow and arrow,

[1] *Ibid*, p. 663.

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and when we take into account that in the use of it, it was necessary to consider distance, wind, varying elasticity of the bow, varying weight of the arrow, shape of the weapon, and the penetrability of the game, and how each of these variables was rendered constant by the hunter skulking, getting to the windward, using wood of the greatest strength for bows, and manipulating it to suit his needs, we cannot fail to see that its use was educative in the real sense of the word. The hunter who was armed with a bow and arrow could not act upon the basis of instinct alone—at every point it was necessary for intelligence to be used.

It is equally possible today for the bow and arrow to exercise an educative influence for a brief period in the child's development. It can serve to refine his instinctive activities, to greatly increase his power to adapt himself to new conditions, and it can introduce him to history and science by means of such practical experience that he may, even in his early years, get an insight into the processes of man in relation to his environment that few attain until they have reached mature years.

The child's interest in boats appears early and continues throughout the elementary-school period. The simpler steps in the evolution of boats, which were worked out during the periods of

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savagery and barbarism, may profitably be considered by the child of seven, the more complex problems of early civilization being postponed until a later period.

The child who lives near the water will have no difficulty in understanding why people learned to swim, and how they depended upon their own bodies in navigating before they learned to make and use boats. The play instincts may be utilized with reference to the serious problems of life if the child be encouraged to work out the problems that confront one when learning to swim; to discover how the functions of the different parts of the body in swimming suggest devices to facilitate the movement of the body and to give it more freedom; and to invent such devices as light wood, gourds, floating logs, inflated skins, and vessels of pottery as a means of support for the body or for a burden, which may be towed along by means of a cord attached to the person.

The consideration of these humble origins is of value partly because it affords an opportunity for the child to experiment along a line that will yield cumulative results, thus meeting the growing demand for a serial arrangement; and partly because it enables the child to grasp concepts represented by the technique in a vital way, thus enabling him to interpret more complex

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forms that inevitably come into his environment later.

The evolution of the wooden boat is a subject that presents many opportunities for utilizing experiences gained in hours of play. It includes such problems as the following: How people learned to reduce the friction of the swimming log by pointing the ends, and, after perceiving the advantage of logs hollowed through their former use as fireplaces, they began to manufacture rude dugouts; how these were paddled with the hands and feet until the happy thought occurred of extending these limbs by artificial means; how these primitive paddles, resembling large ladles or possibly shovels, were used to dig or to sweep up the water; what changes were gradually made in their form and in the manner of their use; how in many cases the hollow log which was so narrow as to cramp the body was widened by the use of hot stones, water, and braces; how both height and width were increased by lashing planks to either side, thus increasing the stability of the boat at the same time; how as time went on the center log became smaller and smaller till it dwindled to a keel which still further increased the stability of the boat; how the side planks were increased until a framework with vertical ribs was added; and how gradually wooden pins were substituted for stitches, and later nails replaced the wooden pins.

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The evolution of the raft is as full of interest. The floating logs brought down by the river in a time of flood offered a strong stimulus to primitive people to risk an adventure. The exhilaration of such a ride would stimulate them to efforts to make it a more permanent feature of their life. By lashing the logs together with strong cords the risk of a cold plunge was greatly lessened. Doubtless, at first, its course was determined entirely by means of the currents of water, but it does not serve man's purposes to leave the control of his affairs to outside forces. He discovers a way of regulating the movement of the raft by the use of long poles. The use to which the raft could be applied in travel and transportation operated so as to bring about further improvements. The clumsy raft gave place to a lighter one, and this to the *catamaran*—a raft of three logs or planks lashed together in five places, the central log being longer than the others in order to reduce the friction. As there was nothing to prevent the waves from washing over this vessel a platform was erected in order to keep the cargo dry.

The catamaran developed into the double canoe on the one hand, and the outrigger on the other. The double canoe at first consisted of two logs laid parallel to each other some distance apart, united by cross-poles upon which a platform was reared. Later the logs were replaced

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by boats, the platform still being retained. The double canoe was an improvement upon the catamaran because it offered less resistance to the water.

The outrigger, which is a small log attached by cross-poles to the side of a boat, served to retain some of the advantages of the raft, and by lightening it, to secure at the same time some of the advantages of the boat. Sometimes outriggers were attached to both sides of the boat.

The evolution of boats of bark, skin, and reeds, is equally interesting. How the best materials at hand in the different areas of culture were utilized in the manufacture of water craft; how these forms were gradually improved in order to secure safety and to economize strength; how special adaptations were made in order to meet special needs; why the paddle gave way to the oar and rudder, and these to paddle wheels and sails; how man devised the shifting sail; how he contrived means of storing provisions for long voyages; why voyages in the deep seas made it necessary for people to guide their course by the stars; how sailing charts were invented; how labor became organized by the needs of these undertakings—these are some of the problems with which the child may well deal in the study of the life of people who live by the sea.

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Perhaps enough illustrations have already been given to show how fruitful the subject of primitive industries is in ideas which connect with the subjects of the school, and how many opportunities it presents of connecting these interests with the play activities on the one hand, and the serious activities of society on the other. With one more illustration for the purpose of showing more clearly how the mechanical principles, made use of in a practical way at this time, may be of service later in the interpretation of industry in the stage of national economy, this phase of the subject must be concluded.

We have already seen how man found his first tools in his own body. He found the motive power with which to work them there too. Just as man's tools supplemented the organs of his body, so the different forces, which after long ages he discovered how to utilize, supplemented his own muscular energy, and were applied in ways marked out by the physical co-ordinations already established. The *push*, the *pull*, and the *twist* of human movements find their counterpart in the forces which we now find in machines.

The mechanical principles which are involved in the most complex machinery are nearly all met with in a practical way in the study of primitive industries. The *weight* was made use of in the digging stick, the spindle, the hammer, and

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the trap; the *elastic spring* was made use of in traps, in throwing-sticks, and in the bow and arrow; the *inclined plane* was made use of in routes of travel, especially if there were burdens to be carried or vehicles to be drawn; the *wedge* was used in felling trees, in making planks, in tightening the lashing of haftings, and in numberless other activities; the *lever* was used in flaking stones, in carrying with several varieties of carrying-frames, and in rowing boats; the *sled* was made use of on the grass, on snow, and on specially prepared tracks; the *roller* was used in landing boats, and it preceded the use of the wheel in the evolution of carts; the *pulley* was used in hauling up large animals from the sea, and in moving heavy weights either horizontally or vertically; the *wheel and axle*, which we find in primitive carts, may have originated in the spindle-whorl, or in the fly-wheel used in drills for making fire, or drilling holes through stones; *twisting*, *shrinking*, and *clamping* devices were made use of in the manufacture of implements; the *screw* is found in its most primitive form in the device to stop the flow of blood from a wound by means of a wooden plug on which has been cut a sort of a "thread," and it was also used in tightening the back of bows and in several forms of traps.

The child of seven is too immature to deal

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with these mechanical devices as principles, and it is not at all necessary that he be taught their names. What is of importance, is that he be given the opportunity to originate these various ways of interchanging the time, direction, and momentum of the forces of his own body in the typical ways marked out by the savage—ways which Mr. Mason says that modern science and industry have been able to improve only by substituting new materials and introducing improved methods of manipulation.[1]

PERIOD OF CHILDHOOD.

In the treatment of this period we shall attempt at this time nothing further than a general statement of the attitudes of the period as a whole and the general character of the work along industrial lines, illustrating only where the situation seems to require it.

The most characteristic features of the first years of childhood are a retarded physical growth and a development of the co-ordinations that control the movements of the finer muscles. This is pre-eminently a motor period. The fact that new co-ordinations are ready for exercise and that less energy is demanded for external growth than in periods immediately preceding

[1] O. T. MASON, "Primitive Travel and Transportation," *Smithsonian Report of the United States National Museum*, 1894, p. 241.

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or following, suggests a reason for the restlessness that is so characteristic of this age. The child is embarrassed by a store of energy over which he has not yet established control. He can maintain a quiet position only with the greatest difficulty. The objective world is now well differentiated from the subjective. The separation between means and ends, which began in the earlier stage, is now more pronounced. He is able to grasp more complicated relations in the means than before. This manifests itself in the character of his games, which are no longer played for the interest in winning, although that interest is still strong. The games played at this time seem often to be played for the sake of acquiring skill.[1] The new co-ordinations are demanding an opportunity to function and offer a sufficient reward in the way of pleasure.

This is the golden opportunity for teaching subjects that require considerable control of technique. The fact that the child's interest in technique is so great that at times he appears to take satisfaction in it when isolated from its vital relations, has led some to characterize this period as the *age of drill*. A more intimate acquaintance with real children is the best antidote for such a conception, which is largely

[1] JOHN DEWEY, *Mental Development*, p. 13 (an unpublished article).

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responsible for the attitude that many people take toward grade teachers.

The differentiation between work and play, which began in the earlier period, is now more marked. The restlessness of the period is not occasioned by a lack of a serious interest in life. It is rather because the child has so many serious interests not recognized by older people. The lack of helpful recognition discourages many a child and demoralizes others.

Because work and play stand out as separate interests, and because the child at this time is so serious, so objective, and so keen in interpreting a situation, the attempt to present work under the guise of play is readily understood by the child and valued accordingly. The separation between work and play at this period is not such as to prevent mutual interaction. Each can profit by its relation to the other. Just as in the earlier period all serious activities were conceived in the spirit of play, now play becomes freighted with the serious interests of life. To force this movement unduly is to arrest development, but to utilize it in the light of the child's changing interests is to foster the habit of conceiving work not as drudgery, but as a free and rich realization of the whole nature.

The socializing and unifying function that belongs to play in the school-room during later

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infancy is now fulfilled by art, which is beginning to be differentiated from work and play. The degree to which art is able to exercise this influence is in proportion to the degree that the native instincts have become transformed into a great variety of habits that function with reference to social life. If this change has been made during the earlier periods, art functions normally at this time. If, however, the attitudes have changed without at the same time becoming socialized, the serious activities are apt to be conceived as drudgery and emotional satisfaction sought in some anti-social form. The problem here is to restore the missing factor whose absence has caused such an isolation of interests.

Fortunately the character of the child is not yet determined. He is still in the process of "becoming." He is still responsive to suggestions—especially along the line of the native reactions of the period.

The spontaneous activities, the traditional games which have had the vitality to survive, and even the activities of children which are interpreted as anti-social,[1] as well as many that really are such, unite in showing that during the period of childhood there is a vital interest in such prob-

[1] The case of a boy of nine, who stayed away from the formal work of the school two days without the knowledge of his parents in order to learn how to develop photographic plates, illustrates how often children may be misunderstood.

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A Way of Securing "A Healthful Attitude toward the School" (page 159).
(Training Department, University of Utah.)

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lems as how man secured dominion over the natural forces, substituting for the motive power of his own muscles that of the beast, the water, the wind, fire, steam, and electricity; and how, in applying these forces successively to the work of society, he invented tools, discovered mechanical principles, worked out metrical apparatus, exploited his environment in search of natural forces, and invented and controlled machines for the more advantageous application of these forces.

Where such work has been offered it has become evident that the opportunity to work out such problems by means of construction, illustration, and experiment is the most natural way yet discovered of securing and maintaining a healthful attitude toward the school. I have in mind the case of a boy in the fifth grade, who, after a change in the work which made room for the use of his own out-of-door experience, acquired such self-respect as to enable him to grapple with the formal work which previously had had no interest for him. The introduction of work of a more practical nature was what he needed in order to establish his relations with the work of the school. Another case of an eighth grade boy points in the same direction. He was so anti-social in his tendencies that he was about to be expelled from school. About this time his

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class, whose work had been of a more formal nature, began the study of the currents of the air by means of constructing fireplaces out of stone and mortar or any other material they might choose to provide. As long as work of this nature continued he was the earliest one at school in the morning and the latest at night. During this time he not only worked at his fireplace, experimenting with it so as to regulate the draft, but he searched through the available reference books for further light upon the subject. As long as he had a problem that he could work out in a practical way he conducted himself in such a manner as to be agreeable to all with whom he had relations. In the same class there was a boy of an entirely different type, in short, he was the "model boy" of the school. While he did not stand in so great need of work of this character he was enthusiastic in working out his problems, and attained very satisfactory results.

There are different degrees in which children of the same age are socialized. These differences are often matters that the school can do little toward controlling. Work which calls out the emotional reactions normal at the time, which presents the opportunity of getting a clearly defined problem, which represents a technique within the possibility of the child's power to

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master, and which is related to the achievements of the larger world in the consciousness of the child, is educative to all children of this period of development.

It would seem, then, that art, which seemed to be the missing factor in the case of the anti-social child, may be restored by means of such appeals as are suggested above. Only gradually, however, does art become sufficiently strong to represent an independent activity. Real art is best promoted throughout childhood by securing and maintaining conditions that make it a *quality of the whole life*, rather than an independent activity. Since the activity of the child must be rooted in experience, the constructive activity must be vitally related to the content studies of the time. By the necessities of the case construction must lay tribute to both art and science. Under such circumstances it is frequently necessary to give considerable attention to the technical aspects of art, which, isolated from vital interests, would be a matter of indifference if not of dislike. When, however, the isolation is for the sake of acquiring the skill that is needed in order to continue a larger process that appeals to the child, he is persistent in his efforts until the end is accomplished.

Most of the industrial processes of the child correspond to the stage of house industries.

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Although these date historically from the earliest human activities to the tenth century they still linger in communities where development is retarded, and they occur in some form in all communities. They fall naturally into two classes, of which the first represents each individual of the group as occupied in doing a variety of work, while the second represents several individuals engaged in one undertaking. The latter may be work where co-operation is used merely to facilitate the work, or it may be work which would be impossible except by means of combined labor.

When each individual supplies his own wants, when he manufactures what he needs, it is very evident that he has his own problems and that he regulates his own activities. When people begin to co-operate the question has a new element. If the labor is free labor, co-operation implies consent, and, although the work undertaken may not represent what appeals most strongly to all, yet the fact that they are co-operating implies that it appeals to all. The regulation of the labor comes from within the group.

In early stages of society the regulation of labor was a serious problem, but the key to its solution came from the treasure house from which man's tools were derived — his own body. Rhythm, which is the key to all primitive regulation of labor, is organic. All accounts which

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we have of the lowest stages of culture show that all such people have some rhythmical form of regulating their labor. It is probable that the advantage of working in a common rhythm would soon be discovered. The common end and the possession of a similar nature would operate so as to force this upon the attention. The primitive dance, which holds in solution both poetry and music, is an effort to secure co-operative action.

The regulation of free labor where the regulation comes from within, and where the labor is directed toward the accomplishment of a problem that appeals to all, is to be distinguished from slave labor in which the workers are regulated from without and are destitute of a problem that appeals to them. To state the difference ought to be sufficient to enable one to choose between the two methods for educational purposes.

No epoch of the past is of sufficient importance to claim the entire attention of the child. His interest is primarily in the present. No use of the past which ignores this fundamental fact can be justified. Its justification must always be found in the nature of the child and in the social needs of the present. Processes which represent work done with simple tools without the aid of machinery will always be significant to the child. Cooking, sewing, and other forms of industry

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that may be carried on with the simplest tools are invaluable at this time. To confine industrial work in the school to belated forms of industry would be to deprive the child of his full heritage. Processes which have been superseded in the industrial world by more complex forms are as significant in education as processes which have not kept pace with the general advance. Processes which represent the co-operation of many individuals in great public works should find a place beside those which represent the satisfaction of individual needs. Activities that minister to the needs of the social group, whether it be the clan, the tribe, the village community, the manor, the city-state, or the nation, are more significant to the child, if approached through the medium of his own constructive activities, than those which minister merely to personal needs.

The transition from barbarism to civilization, if approached through the medium of the child's constructive activities, is as fascinating to the child as to the university student who is able to carry on independent research. If the work is presented so that the child can get his own problems and work them out in a concrete way he can early learn the value of co-operative effort, and, at the same time, get the basis for a clear, historical perspective. The child is interested in determining in what parts of the earth the earli-

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est civilizations would be most likely to develop. He can easily be led to see that they first appeared in the fertile river valleys that were protected by natural barriers, and that the work of clearing the forests and draining the marshes and fens presented problems of such difficulty that they could be solved only by organized effort. When this fact is understood it is easy to see why the development of agriculture in the rich river valleys was always paralleled by the growth of the city-state or by the development of a feudal system.

The contrast which the conditions in an arid region present to the situation in the rich river valleys lends an added interest to a subject which represents a native interest of mankind. When the child has the opportunity to study the topography of the country in a graphic way he is as ready as anyone to suggest ways of changing the course of rivers, building reservoirs, digging ditches, and inventing countless devices which have been used since man first began to reclaim the desert regions.

Phœnicia presents another interesting type that is appropriate to study in this connection. It is interesting to discover why commerce developed in Phœnicia, how it was carried on, what the sailors knew about the earth, what the routes of travel were, what the nature of their boats and cargoes,

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and the nature of other questions with which they had to deal.

In connection with the study of the state of geographical knowledge at this time, the question naturally arises how people learned more of the world. This topic makes an easy transition to the subject of exploration, which is especially appropriate in intermediate grades. The child, as well as the adult, is interested in discovering how the exploration of each period has been affected by the knowledge and the inventions of the time, and how by currents of wind and water. He is equally interested in forecasting the effect of the explorations made upon the various peoples concerned, and in reading accounts of the same in books to test the soundness of his own judgment. His own experience along constructive lines will lead him to see that a period of exploration is apt to be followed by one of colonization. The practical problems connected with colonial life should be treated in such a way as to afford the child a breadth of view which includes a clear picture of conditions in the mother country. This serves as a necessary background for a sympathetic appreciation of the life of the people in pioneer conditions.

There are many problems in primitive engineering, architecture, and mechanics that are especially adapted to intermediate grades. In

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the study of the laying out and building of roads it will be interesting to trace our own routes of travel by land back to the animal trails. We are not accustomed to think of animals as engineers, yet Mr. Hornaday writes concerning the bison: " . . . the trail of a herd in search of water is usually as good a piece of engineering as could be executed by the best railway surveyor, and is governed by the same principles. It always follows the level of the valley, swerves around the high points, and crosses the stream repeatedly in order to avoid climbing up from the level."[1] The history of the changes that have taken place in the trails of animals, the causes for the same, the improvements in the means of travel and their effect upon the relations among neighboring cities and states, the digging of tunnels, the construction of viaducts and bridges—all furnish problems of real value at this time.

The child's interest in the public buildings of his own vicinity may be utilized by simpler problems which are involved in the understanding of ancient public works. How the immense public buildings of antiquity were constructed; how the character of the material affected the mode of construction; how the materials were

[1] W. T. HORNADAY, "The Extermination of the American Bison," *Smithsonian Report of the United States National Museum*, 1887, p. 417.

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tested; how the principles of construction were discovered; how roofs were planned for the massive structures, and how these were related to the climate; how the immense work was carried on by co-operative labor with the simplest tools and industrial appliances; how systems of fortification were planned; how heavy objects were transported; in short, how the simplest beginnings were made in the departments of hydraulic, bridge and road, sanitary, and mechanical engineering, is a subject worthy of the child's attention and one that may be brought within the easy range of his understanding.

Until our knowledge of education shall have become more scientific it will probably be best to leave considerable margin for optional work. There is need in this as in other work for guidance. The teacher's influence should operate to insure the selection of problems of sufficiently difficult technique to be stimulating, but not difficult enough to be discouraging.

Perhaps the more important questions that cluster about the handicraft period are those bound up with such questions as the freeing of labor, the application of the power of the wind and water to simple machinery, the consequent change in manufactures, the development of commerce, the work of the Hanseatic league, the growth of cities during the Middle Ages, the

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regulation of labor by means of guilds, the advance made in more accurate measurement, the artistic work of the craftsmen, and the spirit which gave rise to the cathedrals. These subjects lend themselves to various forms of expression and serve to enrich many experiences of the child. The handicraft period finds its counterpart in the child, not in such a differentiation of labor as will make him master of a craft, but in a differentiation of interests which previously were bound up in a more undifferentiated form. His practical activities in connection with such materials are for psychological and educational rather than for economical ends.

No better means are available for assisting the child to understand the complex industrial organization of the present than to give him an experience in some of the more fundamental processes. The very fact that he has produced raw material, and that later he manufactured and used it, affords him an experience in a whole round of activities, which enables him to place any isolated activity in relation to the whole system of which it is a part. In some cases it may be found convenient for some members of a class to prepare the material for others to manufacture. This division of labor is a type of what is going on in the larger world. Some children will excel in one line of work, some in another.

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The recognition of this fact is significant with regard to understanding the reason for specialization in industrial activities.

If such problems as those suggested in the preceding pages be taken up in the elementary school, the way is prepared for a profitable study of the main steps in the industrial revolution in England and the United States during the last year of the course. This study affords an admirable opportunity for summing up the results of the previous years' work and of more consciously recognizing inter-relations among the various forces involved. These inter-relations are *felt* in earlier years; they are recognized practically, and in some cases they are formulated; but at this time there is a more distinct place for formulation. This change corresponds to the larger place that intellectual interests now take in the life of the child in contrast to the purely practical. But even now, care should be taken not to force intellectual activity unduly.

The child, who has traced the tool from the action of his own body through the various stages of its development, has felt, as he has wielded it, the rhythmic movements of economical adjustments. He is now prepared to see how the mechanical principles with which he became familiar in the study of primitive life are utilized by means of better appliances; and how their

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action, which has been rendered rhythmical and hence automatic, may be handed over to a machine. What this machine is, what its purpose, how constructed, how controlled, and how used for the amelioration of society, these are the problems that the school should undertake to teach him to grapple with, rather than to occupy him with activities that tend to render him as automatic, as unfeeling, as a part of the machine itself.

The construction of simple machines in the workshop, and the tracing of the connections between the steps in the process from the stage of the *hand*, through the stage of the *tool*, to that of the *machine*, with its many possible modifications, is an educative work. It will train the child to control machinery rather than be controlled by it. It will help to advance the movement most necessary at present in order to facilitate the adjustment of labor questions.

The present difficulty consists largely in the fact that the industrial processes have been improved without a corresponding development in the lives of the workers. As long as the worker could get the reflex effect of his own work, his occupation was an expression of his own desires. Now that the process is so complicated it is difficult for the worker to realize that he has a problem or that he has any con-

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trol over his own activities. He is in need of an intelligence trained to recognize the various stages of the work and his relation to the whole; he is in need of sympathies broad enough to take in, at least in so far as the relations of his acts to them are concerned, all those who are to use the product of his labor. Under such conditions manufacturers will not be obliged to make use of inferior machinery in order to supply labor of an unskilled sort. To promote the realization of an ideal which shall secure this high type of humanity is certainly a worthy object of education.

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CHAPTER V.

PRACTICAL APPLICATIONS.—*Continued.*

THE PROBLEM OF THE TEACHER WHO IS NOT FURNISHED WITH MATERIALS AND TOOLS FOR INDUSTRIAL ACTIVITIES.

BECAUSE the materials necessary for working out many of the problems suggested in the preceding chapter are not yet incorporated in textbooks, many teachers may feel at a loss to know how to put the ideas suggested into actual practice. Because the idea prevails that industrial training requires expensive equipments, many teachers fail to see the opportunities presented on every side. To such teachers this chapter is addressed; for the best educational results can be secured only through the co-operation of all the people who have a share in the work.

To undertake several new kinds of work at one time would certainly be unwise. To undertake nothing new would certainly be more unwise. The better plan is to keep the main part of the work in lines which are fairly familiar, leaving a narrow margin for careful experimentation. By following such a method the teacher may feel perfectly safe in introducing a new form of work; for until she becomes convinced

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of its value she may treat it merely as a side-light to some phase of the regular work. As time passes, however, the teacher can readily discover in the response made by the children whether it is best to incorporate the new feature into the body of the curriculum, or whether to let it give place to something which proves to be of greater value. The experience which individual teachers gain in this way is invaluable as a basis upon which to proceed in carrying out the more organized movement which is bound to come. It is the rude structure which bridges the chasm between formal education and that which is real. It is one phase of the pioneer work which must be done before the people are ready to take up the cause.

Perhaps no better means are available for the teacher to gain courage for going on with such pioneer work, and ideas for enriching the course of study, than to re-read the history of colonial times. The efforts of our forefathers in establishing a foothold in a new country may well serve to inspire us with courage in undertaking pioneer educational work.

The popular conception that industrial training cannot be introduced without a considerable expenditure of money rests upon a misconception of its nature and purpose. We have recently become so accustomed to the use of commercially

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prepared materials and finished products that we are disposed to carry the idea over into education and apply it so as to defeat educational ends. If the purpose of industrial work in the school is to secure certain tangible results, questions of economy dictate the use of prepared materials and ready-made tools. If, however, the purpose is to educate through industrial processes, questions of economy dictate that we should employ methods which produce educative results. To furnish the child with commercially prepared materials is to cut him off from those phases of the industrial process which relate him to the natural resources of his own environment.

Rather than be discouraged at the outset because of the lack of money for a material equipment, the teacher should see in the situation the opportunity for the children to come into closer relation to nature, and an opportunity for herself to gain an appreciation of the meaning of industrial work before a general demand is made for it. She should see in it, also, the opportunity to develop the spirit which alone can give meaning and value to equipments, and which will make of them real instruments in the education of the child.

The teacher may not see her way clear, at first, to set aside more than one period a week for practical work. Possibly she may find it

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the wiser plan to begin such work out of school hours and let it be entirely optional. But gradually she should try to make it, not something apart from the regular program of the school, but a means of giving new meaning to each and every subject of the curriculum.

In beginning the work it will be well for the teacher to have in mind several things which the children may make or represent, and give them a chance to consider them with her and to choose that which they think they can do best. Let them suggest ways of getting materials and preparing them for use. To be sure children, as well as adults, sometimes make foolish suggestions, but teachers may well profit from the contributions which children make regarding practical matters. The new interest which the children take when they feel responsible for what they do and say is invaluable in the development of self-confidence and self-respect.

There are many materials which the children may help procure for purposes of practical work in the school. Sand is to be found in most places and is invaluable as a means of representing geographical relations. When the children are trying to get a clear picture of such relations, and trying to express it to others, they are in a position to appreciate the value and the proper use of sand in the schoolroom. Let the children

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suggest ways of getting it and bringing it to the school, and help them to decide which way is the best. Then a box must be prepared for it, which the larger boys can make out of dry-goods boxes. There should be one box as large as the top of a kitchen table, and twice as large if there is room to place it in the schoolroom. The sides of the box need not be more than three or four inches deep. It is a good plan to line the box with oilcloth, but if that is not available the cracks may be stopped with putty or clay. The cumulative interest which arises from participating in this co-operative work presents the teacher with an admirable opportunity for directing the children in a thoughtful study of geography, and in those phases of history in which geographical ideas are important features. But if the way is not prepared, if no idea of the use of the sand is present in the minds of the children, if the strongest suggestion they get from it is to throw it or to use it in annoying a neighbor, the presence of the sand-table will merely be one more opportunity for disorder. The abuse of any material and instrument is possible, but it should in no wise keep us from making a right use of the educational means at our command.

Clay serves a variety of purposes, and can be purchased at little cost; but where suitable clay-beds are accessible, it is far more educative

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for the children to go to the spot, to notice how it is placed, to dig it out—if they have the right to do so—to tread, wash, and knead it, and prepare it for use. The trip to get the clay is interesting to all children in itself. The preparation and care of it might be irksome if there were not present an idea of doing something with it later. Having this idea, the children will gladly cooperate to secure a small barrel or an earthen jar in which to keep the clay, and smooth boards or pieces of oilcloth to protect their desks when they are modeling.

The gravel pits, the stone quarries, and other mineral resources in the locality are interesting to every child from his earliest years. Collections may be made of the different local varieties, and these should be related to such literature of the subject as the teacher is able to find. Collections should also be made of stones shaped into natural tools and weapons, or those which could easily be wrought into such forms. Stones suitable for cutting, pounding, grinding; stones which crumble when heated; and those which will stand the heat—many of these may be gathered and labeled by the children, and be preserved as a part of their industrial museum.

Lessons in history, geography, and nature-study frequently include lessons about the textile industry. In most places children can find at

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least a few natural materials to illustrate typical stages in the development of the art. Tough barks may be manufactured into utensils or shredded so as to make fibers; willows, tough branches of all kinds, may be made into splints or woven in their natural form; tough grasses, rushes, and reeds may be collected from the marshes and meadows, and straw and corn husks from the farm. In country schools it ought not to be difficult to secure a fleece of wool, and, if any of the children have access to a sheep pasture in the spring time, enough tags of wool may be collected from the underbrush to provide material for work for several days. If flax seed can be obtained, the older children can profitably raise some flax in a school garden, and although the products of the garden may not furnish materials for social occupations, the experiment in itself will be of value to the children at the time, will help them to understand related accounts they may read from books, and will furnish experience which will tend to bring them into sympathetic relations with people who are sharing in the world's work.

In connection with the collection of materials for textile work the children may well collect such roots, bark, husks of nuts, flowers, and fruits as will yield a dye which they may use in coloring. To be sure, they can buy "Diamond

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Dyes" for ten cents a package, but the use of such dyes is not educative. By using prepared dyes the children lose the opportunity to experiment with materials. Colored earths and other mineral products which yield color may also be collected and used in experimental ways. Where parents are informed concerning the nature of the work, they will allow much of this experimentation to be done in the home. The ever-present stove in the country schoolhouse may be turned into account as part of the equipment. In schools heated from the basement and not equipped with a laboratory, an oil stove may be pressed into the service of furnishing the necessary heat for dyeing; but in no case should the teacher permit a careless use of fire.

Since a large part of the work in geography consists of a study of the production, manufacture, and distribution of foods, the teacher ought to find no difficulty in selecting topics which embody a great variety of industrial processes. Field trips, excursions, and gardening may be used to make the children familiar with the processes of production in their own community. Excursions to mills and bakeries, practical lessons in cooking which may be learned either at home or in the school, and constructive work which represents processes of manufacture which the children may have difficulty in carrying on in a

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real way, furnish a sound basis for a study of the processes of manufacturing food-stuffs. A visit to the grocery store, observation of the trade which takes place in the home community, the routes of travel and modes of transportation, together with the representation of the same in graphic forms, serve as a mode of approach to larger problems of distribution and exchange.

Collections which illustrate the food-stuffs of the community, as well as those imported to it, may be used as a mode of approach to many problems in commercial geography. A shock of corn or wheat, vegetables, fruit, a pan of milk, may be procured with little trouble, and may furnish material for many practical lessons in the study of foods.

Although it would be difficult to give systematic work in cooking without an equipment, it is possible to study typical vegetables, fruits, grains, and meats with reference to the best mode of cooking them. In schools where it is necessary for many children to remain during the noon hour, it ought to be possible for the school to make provision for giving the children at least one kind of warm food, which could be prepared by one of the classes with the use of only a few cooking utensils.

Materials for sewing are those most easily procured, and if the articles made are those in

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which the children take a genuine interest, the teacher need not be disturbed if she is not able to relate each period devoted to sewing to some other subject pursued in the school. Yet as the work proceeds, much is lost if the children do not get ideas which will help them to understand the social significance of such work.

Sewing materials for the younger children can readily be obtained from the rolls of scraps which may be found in every home. Merchants often have odds and ends which they are willing to donate for such purposes. These materials may be used in making dolls' clothes, and the bedding, curtains, and other furnishings required for a doll's house. The children may also make bags for their materials, and hem towels and dust-cloths which they need for their school housekeeping.

The older children may use the period devoted to sewing in making articles of clothing they may need. This is by no means an experiment, but is practiced in many schools. The girls of the eighth-grade graduating class in some schools make their own graduating dresses. Boys take as much interest in sewing as girls, when not influenced by some superficial adult, but they may not care to make the same things. A boy in one of the cities of Illinois asked if he might make a pair of "overalls," and his teacher wisely

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permitted him to do it. When parents realize that their children are actually learning to cut, fit, and sew garments, they will be willing to provide all the materials for sewing which the teacher can find time to have used.

Wood-work as usually carried on in the schools requires a special room equipped with benches and tools, as well as considerable lumber and nails. Much as children enjoy the period when they are allowed to take up such work, they often go through the course in manual training without gaining any conception of its social significance. Where this is true it is largely because manual training is isolated from the other subjects of study and made an end in itself. Such isolated work, no matter how expensive the equipment, cannot compare in educational value with that carried on with the barest equipment, yet consciously related to the curriculum as a whole.

No course of study is so formal that it does not include such topics as the various kinds of shelter which are used by different peoples, the methods of building, and the tools used. To be of any real value to the child, such topics need to be illustrated. Pictures are useful, but the child needs not merely to receive impressions, but to have an outlet for his growing images. Such opportunities need not be denied, for many of the materials are not expensive. Typical dwell-

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ings of the primitive type may be represented by the use of bark and twigs. The materials essential to the construction of a model of a log house can be found almost anywhere. These materials can be used with the simplest kind of tools—in many cases natural tools. But a few tools are very desirable. Among such the pocketknife owned by every boy, and almost every girl, may be called into service. Undoubtedly volunteers will bring in a hammer, a saw, or any other tool which seems to be needed for the time, in order that the work may go on.

Building-blocks, which are invaluable in the lower grades for representing houses, barns, fences, wagons, trains of cars, and many other images of the child, may be made by the older children out of short pieces which can easily be procured in places where lumber is used for manufacturing purposes. In country places it is almost always possible to procure such pieces from the refuse where new buildings are being erected, or from the lumber pile of some generous farmer. In measuring and sawing the blocks there is an opportunity for careful measurement and work of considerable precision. While it is not necessary for the blocks to be of certain sizes, it is desirable that their dimensions be simple enough for the children to work with in an intellectual way. For instance, it is better to

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FREE BLOCK BUILDING.
(TRAINING DEPARTMENT, UNIVERSITY OF UTAH.)

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have blocks $2 \times 4 \times 6$ inches than $1\frac{7}{8} \times 3\frac{2}{5} \times 6\frac{1}{4}$ inches. Again, it is well in planning the making of blocks to provide for enough of the same shape and size so that in building the children can get the idea of rhythm and order. Square blocks cut diagonally give opportunity for a greater variety in building, and handles of wornout brooms cut in suitable lengths will be found useful to the child in expressing many ideas for which the square blocks are inadequate. There are few places where it is not possible to find a pile of discarded brick, which are capable of rendering excellent service as building material.

As work with such wood as can be collected in its natural state, and with the waste products of the industrial life, goes on, the difficulties experienced, together with the sense of satisfaction in building, are such as to create a demand on the part of the children for commercially prepared materials and a set of tools. The example set by the Ethical Culture Schools in New York in providing a workbench and a set of tools for each room may well be followed. In that school the benches are used to supplement well-equipped manual-training rooms, rather than as a substitute for them; but in schools not so equipped, the single bench and a set of tools may serve as a means of transition from the cruder work with such tools and materials as can be found, to the

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work in a school which is well equipped for industrial training.

When once the teacher and the children begin to search for materials, it will be surprising to find the number of things which can be found with very little trouble. Such objects as stones, bones, horns, seeds, nuts, acorn-cups, rose-hips, river- and sea-shells, and the shells of gourds and other hard-shelled vegetables, all can be used in a variety of ways which will unite the child by stronger ties to his natural and social environment.

In exploiting his environment for materials, the child brings back, in addition to the tangible materials which he needs to use, ideas and suggestions which affect his work in many ways. The ideas which the child gains from observing nature, and which he represents in dramatic play, in paintings, drawings, quick blackboard sketches, and in modeling in clay and in sand, have a real value as well as the ideas which he gets through selecting and preparing materials which he needs in constructing objects which he can use in a real or a symbolic way. The contact which the child gets with nature is of more value in the early years than the constructions which he makes out of materials brought home. Yet both phases of work are necessary, and as the child advances in years, real construction which requires more and

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more accurate methods of work deserves a larger and larger place.

Industrial education need not be delayed on account of difficulty in procuring materials. The children are willing to furnish their share and can find most valuable occupations in so doing. The farmer, the merchant, the lumberman, the manufacturer, each in turn, may easily be induced to co-operate to the extent of allowing the by-products of his industry to be used. In addition to this, the school garden may be used so as to furnish a delightful occupation to the children at the time and products which may be used in school lunches, for cooking, drying, and preserving foods, as well as for experimental work. When all these sources, and many others which will suggest themselves to one who is interested, have been made to yield their share in supplying the necessary materials, there is still another which any school may employ. It is the system of exchanging materials. This exchange may be carried on informally, the child getting an experience in the beginnings of trade; or use may be made of such bureaus of exchange as that of the American Bureau of Geography at Winona, Minn.

A plan adopted this year by Mrs. Bessie B. Rogers, of Elgin, Ill., for directing the children in their vacation work for the summer, is too full

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of promise not to be noticed in this connection. The plan arose partly from the desire to help the mothers who have difficulty in finding employment for their children during the long summer vacation, and partly from the desire to have the children procure materials for the practical work of the coming year. It consisted of a notebook made by the children, with directions at the top of each page regarding objects worth collecting and the method of preserving them. The children who had these notebooks resolved that when during the summer they did not know what to do, instead of asking their mothers, they would go to the little books for suggestions.

Until school buildings are erected which embody the idea of industrial education, teachers must be willing to make use of the schoolroom and yard, the cloak-room, or the homes of the children for carrying on certain phases of the work. And we may be sure that, as soon as the value of the work has been clearly demonstrated, the American public will not be slow in responding with buildings properly equipped. The hardships, the struggles, the aspirations, which are beneath the pioneer work will bear fruit in a spirit worthy of the equipment which is bound to be erected by the generosity of the public.

Pictures which illustrate various phases of industrial processes and modes of living are too

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valuable to be neglected, and, in this day of cheap reproductions and well-illustrated periodicals, a large collection of valuable pictures can be made by any child who is disposed to save what he can readily find. If the teacher will lead in this work and secure the co-operation of the children in collecting and arranging the pictures in suitable ways for ready reference, a most important feature of the school equipment will be secured. Especial emphasis should be placed upon the selection of pictures which illustrate particular subjects of study. For instance, when studying the colonial history of New England the children should be encouraged to collect pictures which illustrate the geographical features, typical landscapes, pioneer houses, furniture, fireplaces, cooking utensils, farming tools, mills, the people themselves, their modes of dress, their public buildings, and their co-operative industries.

Pictures found which are valuable for reference and yet not available for cutting, mounting, and filing, may be catalogued so that, when the topic which they illustrate is reached, they may readily be found in the book or periodical in which they occur. Small pictures may be mounted on manila cards and filed in shoe boxes, or they may be mounted on heavy sheets of cardboard or in scrapbooks made of paper cambric. The larger pictures should be mounted on cardboard.

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Great impetus is lent to industrial work, especially in the earlier stages, if such products as can be preserved for a few weeks are saved and exhibited some afternoon or evening when the parents are invited to inspect them. Exhibits to which the parents and friends of the school are invited are valuable as a means of arousing interest in the cause. If the children or representatives chosen by classes are present to explain the work to the parents, the exhibit will be of far greater value than if the children are not there.

When such an exhibit is ended, the teacher may be at a loss to know what to do with the articles made. Those valuable from the strictly utilitarian view readily find a place. Models of houses, furniture, tools, carts, etc., which are invaluable to the children while they are making them, may accumulate in such numbers as to be in the way. These must be disposed of from time to time. In schools where social occupations are already an important feature it has been found that the children are so eager to take the products of their workmanship home that it is difficult to keep many specimens of their work in the schoolroom. While this tendency on the part of the children is a good sign, it would be well also to make use of this opportunity to cultivate a more social spirit. It would be well for the children and the teacher to decide which pieces of work

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are most representative of that which they wish to do, and to save such pieces in some place which may prove to be the nucleus of an industrial museum. A shelf in the schoolroom may be large enough for some time, but as the articles accumulate, and the need is felt for room to arrange them in ways which will show the idea intended, there will be a demand for more room. If no vacant room can be found in the building, it may be that some friend will be glad to offer the use of a room for such a purpose until a suitable room can be found in the school building. If, in addition to the specimens of the children's work, there are gradually collected real implements and tools formerly used in industrial processes, the collection may prove to be of interest, not merely to the children, but to the entire community. The industrial museum at Hull House, Chicago, is worthy of careful study.

There are few places at present which cannot produce such articles as looms, spinning-wheels, reels, swifts, and hand-cards, used only a few years ago in all the homes of this country. If to this collection be added a Dutch oven, a bake-kettle, and other articles used in cooking at the open fireplace, and if candle-molds, candle-sticks, lamps, lanterns, and other products of pioneer days be added, it will be easy for the teacher to give the children an adequate concep-

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tion of the life of our forefathers during the colonial period. Such collections can be made with comparatively little trouble, if made soon. But if the matter is delayed, the simple implements which help to tell the story of the simple mode of life a few generations ago will be difficult to procure. Such collections arranged with reference (1) to giving a picture of the life of a given period, and (2) to giving the sequence of activities during the year, or within a process, will prove helpful in giving related conceptions of the life of a few generations ago.

Where good reference-books are not available, teachers can learn from the older people of the community much of the life during pioneer days By enlisting the co-operation of the children in collecting and organizing such information, it can be preserved in a form for future reference.

SUGGESTIONS FOR INDUSTRIAL ACTIVITIES WHICH MAY BE INTRODUCED IN SCHOOLS NOT EQUIPPED FOR MANUAL TRAINING.

Suppose that a brief sketch of the situation in England which caused the Pilgrims to migrate first to Holland and later to the New World has been presented, and that the children have followed the narrative to the point where the "Mayflower" dropped her anchor and parties of men went to the shore to choose a suitable site for a home.

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To help the children judge intelligently concerning the merits of the different places explored as sites for the colony let them express their ideas, even though they be vague at first, concerning what the people will have to do in their new home. Remembering their meager equipment and the great distance which separates them from the mother-country, the children can readily see that the colonists must rely chiefly upon their own efforts in supplying food, shelter, clothing, and the other means of maintaining community life. This being the case, they can also see the advantage of a good soil for farming, fresh-water springs and running brooks for supplying water, an abundance of wild game for hunting, a variety of fish for fishing, forests for furnishing materials for building purposes, a commanding view from which the approach of an enemy can be discovered, a place easily protected and so situated as to have the advantage of natural water-ways and inland trails, and a harbor deep enough for the entrance of ships from across the seas as well as smaller boats which might be used in a coast trade.

Let the children study the geography of Cape Cod and model it, together with the adjacent mainland. Then the distance should be reckoned from Cape Cod to the mainland, so that the children can realize the time it would take to make

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the trip by boat or on foot. In this way, perhaps, the children may be able to realize the force of Mr. Doyle's statement in *English Colonies in America*, Vol. I, p. 50, where he says that if the Pilgrims had settled on Cape Cod, "on the point of a peninsula separated from the mainland by a long narrow strip of land or by twenty miles of sea, Plymouth could not have maintained, as it did, a regular and well-organized system of extension."

When it is evident that Cape Cod is not a favorable place for a settlement, the children are ready to consider the reports of the different parties who went out in the mended shallop in search of a favorable site. They will now be ready to understand why the site first discovered by a party led by Standish on land, and later visited in the shallop by a party of twenty-four colonists, the shipmaster, and ten of his sailors, was rejected on account of "the insufficiency of the harbor for the accommodation of large vessels, and the uncertainty as to a supply of fresh water."[1]

As the children consider the comparative advantages of the two sites discovered in the final expedition, they should, as they consider each point, represent it on their sand-map in order to keep the facts in relation to the subject

[1] JOHN GORHAM PALFREY, *A Compendious History of New England*, Vol. I, p. 63.

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under discussion. Let the children search books of reference for all the information they can get concerning the two sites, and when they have gained all they can and represented it on their maps, they may be supplied with any of the facts in the following quotations which they may not have succeeded in discovering:

Monday they sounded the harbor and found it fit for shipping, and marched also into the land and found divers cornfields and little running brooks—a place, as they supposed fit for situation . . . . so they returned to their ship again with this news to the rest of their people, which did much comfort their hearts.[1]

The hard work of clearing a site was therefore saved them, which was a matter of grave consequence at this time of year. On one side was a running brook which they found to be excellent water. Good timber trees for building were rather far off, yet even this was better than having the forest too near, for since their fight with the Indians the Pilgrims felt that their chief safety lay in their weapons, and it was better to have the woods, in which they lurked to steal upon them, as far off as possible.[2]

Two sites of land seemed to offer themselves as suitable; one on an island at the mouth of the harbor, the other by a river which fell into the middle of the bay. The security promised by the island was a strong argument in its favor, but the want of spring water there and of cleared ground, finally decided the settlers in favor of the main-

[1] Quoted by PALFREY in *A Compendious History of New England*, Vol. I, p. 64.

[2] DRAKE, *The Making of New England*, p. 81.

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land . . . . Two arms of land, separated by a narrow opening, ran out, the northern one rather more, the southern less, than a mile long inclosing a harbor of about a mile in width. Among the recommendations of this site was the proximity of much cleared corn land, and of a high hill commanding a view over the whole bay.[1]

Having determined the site of the settlement and having represented it on the sand-map, the next important problem for the children to solve is that of determining what the Pilgrims will do in making the beginnings of a new home and in finding out whether the plans which they make for them were the ones adopted by the Pilgrims. After a brief forecast of the probable events of the winter, the narrative as given in the text-book should be studied, and supplemented by such available references as furnish data which the children can use.

The position of the "Mayflower" during the winter, as it was anchored a mile and a half from shore, may be shown on the sand-map, so as to help the children realize that in the cold and stormy weather of December and January, when the Pilgrims were beginning to establish themselves, their situation was such that they had to expose themselves constantly to the elements, and that such exposure, following the long hard voyage in which they had been obliged to live under

[1] DOYLE, *English Colonies in America*, Vol. I, p. 51.

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conditions which were unsanitary, prepared the way for the sickness which cost the lives of half their number. Knowing that the Pilgrims had little ammunition, and that they were not used to hunting, the children can understand why they had little venison and wild fowls at first; and knowing that they were suffering from sickness the children can understand why such food supplies as were left in the "Mayflower" after the voyage, supplemented by coarse mussels, oysters, clams, ground-nuts, and acorns, were not what they needed. The corn which Standish found in the Indian granaries should be noticed, as well as the forethought of the Pilgrims in saving it for seed instead of using it for food.

While the "Mayflower" was anchored in the harbor, the Pilgrims were busy in laying out the village and in building the first rude structures which were to be their new homes. The representation of this work in the sand-box, in the school-yard, or in any other available place will be found to secure a willing and an eager study of books, for it serves to place books where they belong. Instead of being an end in themselves, they now find their place as a means to an end.

Let the children represent the Pilgrims as they brought their cannon to shore and hauled them up the hill. Let them lay the platform on the

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hill, and place models of the cannon upon it in such a way as to command the different approaches to the site of the village.

As the children plan the best way of laying out the village and the easiest way the Pilgrims can provide a shelter, tell them that in order to save work the Pilgrims divided themselves into nineteen families, and that each family was to be given a lot for a house and garden. These small lots, some of which were two and three-fourths yards in breadth by sixteen and one-half yards in length, were thought to be large enough for the time; and since they had to be surrounded by a heavy stockade, it seemed best to make them no larger.

The lots were laid off on opposite sides of "a broad street, about a cannon shot of eight hundred yards long, leading down the hill with a street crossing it in the middle, northward to the rivulet" and southward to cleared corn-fields. This plan of a village was one which the Pilgrims had been accustomed to in Holland; and since the double row of houses to be erected promised to be a good means of protection from enemies, it seemed well adapted to their needs in the New World.

Although the streets were laid out and the lots measured as early as December 28, little progress was made on the private dwellings which

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CONSTRUCTIVE WORK WITHOUT AN EQUIPMENT.
(ST. LOUIS PUBLIC SCHOOLS.)

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were to be built by individuals. The most pressing need was that of erecting a common shelter. In discussing the materials out of which the common house was built, the children should be helped to see why it was made of logs and not of sawn lumber, stone, or brick; why it was covered with thatch instead of shingles or tile; why the chinks between the timbers were plastered with clay or with a mortar made of clam-shells, instead of being covered with clapboards. Knowing that the timber is some distance from the site of the village, that the trees have to be felled, trimmed, hewed, and hauled to the site without the aid of horses or oxen and with only the simplest tools, and that the weather was so cold and stormy that the men could not work more than half the time, the children can understand why the work proceeded slowly.

The common house was twenty feet square and "made of hewn logs, pointed with mortar or mud in the chinks between the timbers, and thatched." By January 9 it lacked only a roof to complete it, and the men worked so busily during the next four days that the roof was half thatched.

It is not necessary to follow the narrative of life during the first winter any farther in this place. Enough has been given to suggest several kinds of work which the children can do in order

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to make the life real. The representation of the village streets, the plots assigned to individual families, the location of the common house and a small house near it which seems to be the only small house completed that winter, and the beginnings of several houses, will serve to give a view of the village as a whole, while the representation of a larger model of the common house than the scale adopted for the village permits, gives a better idea of the method of building as well as a better idea of the house itself. If, in addition to this work, the children be encouraged to collect pictures which will illustrate different phases of the life at this time, and if they draw or paint pictures illustrating typical activities of the Pilgrims, there will be no lack of interest in the work.

The following subjects are suggestive of work which the children may do in drawing and painting to help make the life of the first winter more real:

Mending the shallop.
Repairing the tools.
Standish leading a party of men in search of a site.
Cutting eelgrass and cattails for thatch.
Lost in the woods.
The first washday in New England.
Laying out the village.
Felling trees for the common house.
Hauling logs for the common house.

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Mixing mortar for the common house.
Building the common house.
Stormy gusts of February.
Life in the "Mayflower."
Hunting during the first winter.
Fishing during the first winter.
Searching for ground-nuts.
Digging clams.

Selections from the above list may also be used for compositions. The children may make such lists for themselves and, if allowed to do so, can help the teacher in furnishing valuable ideas for the recitation period.

In studying the life of the colonists the first summer, the map or maps showing the site and the village as it looked in the winter will make a good starting-point. To this should now be added such features as are typical of the life in Plymouth the first summer. The following subjects lend themselves to sand-modeling, constructive work, dramatization, painting, drawing, and language:

Planting the first crops.
Hunting for wild foods.
The erection of the public building, which was a church, a fort, and a storehouse, all in one. (This building was placed near the top of the hill which commanded a view of the surrounding country. It occupied the spot where the platform with the cannon stood during the first winter.)
The erection of seven private dwellings, with a garden made just back of each.

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Building the heavy stockade as a means of protection.

Guarding the three gates in the stockade.

Preparing the first cargo to be sent to England. (This cargo consisted of beaver-skins, wainscoting, and sassafras, and was the first payment to the merchants who furnished the money for the voyage of the Pilgrims to America.)

The arrival of the "Fortune" with fifty new settlers.

Relations with the Indians.

In the case of children who have not had experience on a farm or in working a garden, the actual cultivation of a garden is almost essential to an understanding of the farm life of the Pilgrims. Whether an actual garden be used or not, the representation on the sand-map of the cleared corn-fields which the Pilgrims first used, and the twenty-six acres which they succeeded in clearing during that summer will be valuable in picturing the life of the little community. Concerning their first work in farming, Mr. Palfrey writes:

The settlers had no working-cattle. In early spring they opened the ground near their dwellings with the spade, and prepared their rude gardens. They sowed six acres with barley and peas. Their good fortune in the winter at the subterranean storehouses had given them ten bushels of Indian corn for seed. This sufficed for the cultivation of twenty acres, Squanto instructing them how to plant and hill it, and to manure it with fish.[1]

[1] See *Compendious History of New England*, Vol. I, p. 70.

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No doubt the Pilgrims made a mistake by beginning to work in their gardens March 7. They were not used to the cold New England climate, and they were not expecting so many cold days as they had. The early planting may account for the fact that the "peas failed" and the "barley was indifferent good." But the Pilgrims succeeded in harvesting a good crop of corn, for which they were duly thankful.

If a shock of corn can be brought to the school, it can be so used as to be very helpful. A few stalks of corn may be used so as to decorate the schoolroom; but the main purpose of bringing it to school is to provide materials for practical lessons. The children can husk the corn, leaving the fine white husks on the better ears so as to braid them and hang them up for seed; they can save the white husks to illustrate ways the colonists used them for braiding mats, and, at a later period, for making collars for the horses; or they may use them for making baskets which they may wish to use themselves.

The drying, shelling, and winnowing of the corn may be done out of school hours, if it seems best to the teacher. The cobs should be saved, and part of them may be given to the little children to use as substitutes for building-blocks. Others may be used in the representation of phases of life in colonial homes.

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The problem of the children in grinding the shelled corn is, in many respects, like that of the first colonists, and the methods they adopt will be much the same, not because the children are re-living that period, but because the problem in the two cases is similar, as well as the means available for its solution. It would be interesting to find out how many ways the children can discover for grinding the corn by making use of the simple implements they can readily find. When the children begin to compare the different methods they have used in grinding, their attention will doubtless first be given to differences in the means employed. But as they proceed in the comparison, someone will be likely to notice that, in spite of the differences, in every case the meal was manufactured either by *pounding* or by *rubbing* the corn. A mortar and pestle made by the children will serve to illustrate the most typical method of grinding by pounding and an old coffee or spice mill which they may be fortunate enough to find will furnish opportunities for studying methods of grinding by rubbing. After using such a mill by hand, the children may be interested in contriving the apparatus necessary in order to run the mill by animal, wind, or water power. In buildings supplied with water-pipes, the little stream of water from the faucet may be used as a substitute for the river, and where

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such means are not available, the ingenuity of the children, if it is free to express itself, will not be slow in devising equally satisfactory substitutes.

Such work opens up the whole question of colonial milling, and while engaged in such work the children will be eager to search books to find out all they can on the subject. This is the time when they will appreciate such facts as those which can be gleaned from Weeden's *Economic and Social History of New England* and from Bishop's *History of American Manufactures.*

In representing the new buildings which were erected during the first summer, the children will be glad to be able to name them. Just above the common house, which is near the shore on the south side of the street and opposite the cleared corn-field which has since been known as Burial Hill, were the houses of Mr. Brown, Mr. Gardiner, who became a seaman, and Mr. Brewster, the minister, whose house was on the southeast corner of the intersecting streets. Directly opposite the houses of Mr. Brewster and Mr. Gardiner, on the north side of the street, were those of Mr. Hopkins, a man from London, and Mr. Howland. Diagonally across from the house of the minister was that of Governor Bradford. In the large space where the streets intersected four

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cannon were placed so as to guard each part of the two streets. The house adjoining that of Governor Bradford belonged to Miles Standish and John Alden, this house being the farthest up the hill on the north side of the street, and nearest the public house on the hill which served as a church, a fort, and a common storehouse. On the south side of the street, and almost opposite the church, was the house of Mr. Winslow. With these data the children can reconstruct a map of Plymouth as it was in 1621, and in so doing get a far better conception of the place than they could by merely looking at the most elaborate map that could be made. When these houses are represented in a simple way, and when the whole model is surrounded by a representation of a heavy stockade with gates at the northern, southern, and western approaches, the relations of the various parts of the village will be clearly expressed.

As data for the first dwellings of the people, Mr. Weeden's description in his *Economic and Social History of New England*, p. 214, may be used. The house of the first period was

> a plain, rectangular house of one story, with two rooms, a kitchen or a living-room, and a family bedroom, with one or more beds and a trundle-bed. There were rude sleeping-places in the garret, under thatched roofs, whither those beyond maternal care, and active enough, climbed by a ladder.

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The doors to these houses hung on long, heavy, wooden hinges, or on hinges made of thick pieces of leather. The oiled-paper windows were latticed for protection. The chimneys and fireplaces were made of sticks and plastered with clay. The few iron cooking utensils brought from England, the plain chest which served as trunk, table, and chair, were supplemented by such hand-made utensils and furniture as the busy people found time to make. In picturing the life of the Pilgrims during the first few years, the children must remember that they had many things to think about besides their own comfort. The company of merchants in England was complaining because the "Mayflower" returned without a cargo, and could not understand that, during the hardships of the first winter, the Pilgrims had no time to procure materials to send to them. In representing the work of the first summer the children may make drawings of John Alden as he supervised the men cutting timber and making clapboards to send to England; they may also represent Dr. Fuller as taking charge of the work of stripping off sassafras from the trees, and others buying furs from the Indians. Pictures of loading the cargo, the departure of the "Fortune," the plunder of the cargo by a French cruiser, the dissatisfaction of the merchants in England, even though

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executed crudely, will serve to emphasize important links in the chain of events which makes history.

Since the New England colonies depended chiefly upon agriculture, the fisheries, and trade, up to 1640 when the civil war in England cut off emigration and trade, and forced the colonies to develop manufactures and the homespun industries, it would be well for the teacher in planning her work to keep these three industries in mind, and to shape the practical work of the children so as to make it give insight into the ways in which these industries helped to mold New England life.

In the study of New England agriculture the successive steps by means of which the colonists passed from common fields to individual annual holdings assigned by lot, and later to permanent holdings of farm lands, while the meadow lands were still held in common, may be shown in a succession of maps showing the division of the fields.

Concerning the allotment of land in the spring of 1623, Mr. Palfrey writes:

> To each family, in place of the partnership labor hitherto maintained, had been assigned in the spring the cultivation and usufruct of a separate parcel of land, the unmarried persons being each attached to some family, and a provision being added that each cultivator should at harvest-time bring in a competent portion for the maintenance of public officers, fishermen, etc. This method made all

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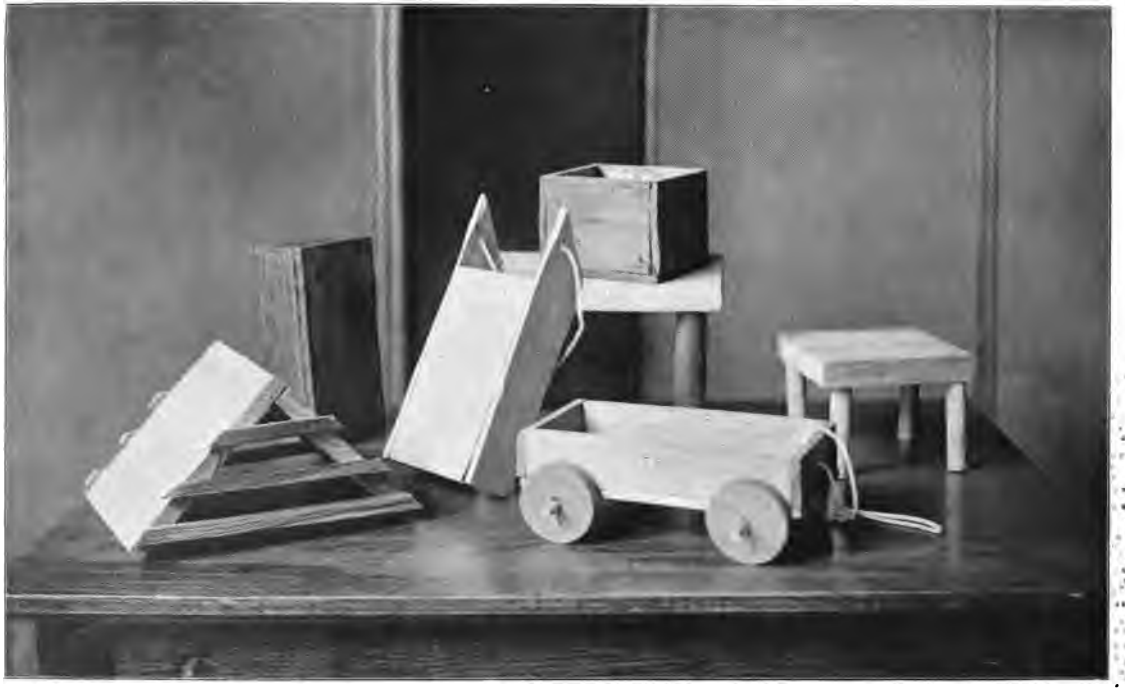

WOOD-WORK RELATED TO THE STUDY OF FARM LIFE.
(ETHICAL CULTURE SCHOOL, NEW YORK CITY.)

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hands very industrious, so as much more corn was planted than otherwise would have been, and it gave far better content. The women now went willingly into the field, and took their little ones with them to set corn whom to have compelled would have been thought great tyranny and oppression.[1]

Perhaps the change made in the allotment of land in 1627, the year in which the Pilgrims dissolved partnership with the merchants in England, is the next one which it is worth the while for the children to take into account.

The land along the banks of the stream to the south of the town was divided, by officers specially appointed, into patches of twenty acres each, with a river frontage of five acres. These were then assigned by lot to the different householders. At the same time the system of separate holdings did not at once supersede that of common tillage. Since it was beyond the power of a single householder to till twenty acres of ground at once, only those lots which lay near the town were to be taken in hand. Each landowner whose plot was brought under cultivation was to associate with him a certain number of his neighbors chosen by himself, or, in default, assigned to him by the governor and assistants. This arrangement was to last four years. The owner was to reserve for his own use twice as much land as he could reclaim during that time. Meanwhile his associates were to live on the rest, and at the end of the term to proceed to their own holdings. The owner of each plot was to have full rights over all timber which grew upon it, but he was to enjoy no monopoly of

[1] See *Compendious History of New England*, Vol. I, pp. 81, 82.

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fowling or fishing and he was bound to leave a footpath through his ground.[1]

The method of farming before the use of cattle and horses can be best appreciated by the children if they are helping take care of a school garden. If to this experience they add the making of drawings of such simple farming implements as those brought by the Pilgrims from England, and if they make models of the simple, natural tools which the people were obliged to make, the earliest period of farm life in New England ought to be fairly well understood.

We are told that each planter migrating to New England was advised to take one broad hoe, one narrow hoe, one broad ax, one felling ax, one steel hand-saw, one whip-saw, one hammer, one shovel, one spade, two augers, four chisels, two piercers, one gimlet, and one hatchet.[2] We may be very sure that the Pilgrims were not so well equipped with tools as this, but they undoubtedly had iron spades for digging up the soil, hoes for cultivating the crops, and sickles for reaping For threshing they could easily make a flail out of two straight saplings and a short piece of leather. We may well believe that the Pilgrims had enough hoes to use; for we read of their trading them to the Indians, who gladly substi-

[1] DOYLE, *English Colonies in America*, Vol. I, p. 63.

[2] See DANIEL WAIT HOWE, *The Puritan Republic*, p. 132.

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tuted the more efficient tool for the clam-shell hoe the Indian women had used. An important point to emphasize regarding the tools is that those made at first were chiefly of wood, and that natural forms, which required the least amount of labor to shape, were sought with the greatest care.

> When the mower wanted a new snathe or snead, as he called it, for his scythe, he found in the woods a deformed sapling that had grown under a log or twisted around a rock in a double bend, which made it the exact shape he desired. He then whittled it, dressed it with a draw-shave, fastened the nebs with a neb-wedge, hung it with an iron ring, and was ready for the mowing-field.[1]

With the introduction of cattle and horses the colonial farmers were able to make much more rapid progress. The first cattle, a bull and three heifers, were introduced in 1624. In 1625 there were nine cattle, and in 1627 there were twelve cows in Plymouth. Not until the first ten years of pioneer life had passed did the Pilgrims have many cattle. Their neighbors, the Massachusetts Bay colonists, had cattle from the first, and so were able to make use of them in their farm labor as well as for dairy purposes.

As the children try to represent the life of the colonists between 1630 and 1640, when they have plenty of cattle and are entering upon a

[1] ALICE MORSE EARLE, *Home Life in Colonial Days*, p. 308.

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period of prosperity, let them represent on their maps the meadows and marshes where the native grasses grew, without which the cattle could not have lived. Mr. Weeden, in writing of the best soils where the timber and brushwood had been kept cleared by the fires kindled by the Indians, states: "The grass was close-set, waist-high, and in some places as high as the shoulders." Without this grass the cattle could not have been reared, and without cattle the colonists would scarcely have been able to subdue the wilderness.

Let the children picture the cowherd as he started on his day's work an hour after sunrise each morning blowing his horn as a signal to the villagers to be ready with their herds. Let them follow him in imagination through the day until, as the sun gets low in the west, he drives the long line of cattle toward the village, again winding his horn as a signal to the villagers to let down their bars and receive their respective herds. Milking the cows, straining the milk, skimming the cream, churning, gathering and working the butter, may be described as a composition exercise by children who have the experience. In the case of those not familiar with such work it is worth while to help the children get the experience by doing some of this work at school. This may be supplemented by pictures, descriptions.

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and illustrative constructive work until the children have had sufficient opportunity to grasp the subject.

The presence of cattle means not merely their assistance in farming, but it means that the colonists must make plows to take the place of their spades, "horse-hoes" to supplement hand-hoes, carts and racks upon which to load the farm produce, ox-yokes and other forms of harness in order to attach the animals to the machinery which they are to work. Stables and barns, too, must be made to shelter the animals, and corn and hay provided for their food. All these points may be illustrated in graphic ways which will form a variety of useful occupations.

When the study of the changes wrought in farming by the introduction of cattle has been finished, it may be well to notice that the increased demand for agricultural implements creates in turn a demand for iron works. At the same time, tanneries are erected to manufacture leather for harnesses, straps, and sundry other purposes, and mills to grind grain as well as to manufacture lumber for the buildings and implements needed on the farms. These facts should be noticed at this time, if for no other purpose than that of turning the child's attention to certain factors which were dominant in the following period, beginning about 1640.

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Although the settlement of Massachusetts Bay Colony is of much more significance in the development of New England than that of Plymouth, if the children have reconstructed the life at Plymouth by means of sand-modeling, constructive work, drawings, paintings, and dramatization, they will be prepared to understand the life of the later and more powerful colony without taking time for so many practical activities as have been suggested in connection with the study of Plymouth. It will be well, however, after a brief account of the first events in the history of that colony to model a typical township, showing the location of the streets, public buildings, homes, farms, pasture, and woodlands.

The following quotations may be helpful as a guide in the children's representative work:

When settlers came over from England to Massachusetts, they usually came in congregations led by their ministers, and settled together in parishes, or townships. In this way the soil of Massachusetts gradually became covered with little self-governing republics, called townships, or towns, each about six or eight miles square, with a village street for its center, surrounded by spreading farms. The church in the village was used, not only for religious services, but for transacting public business, and was always called the meeting-house. At a later time it was used only as a church, and another building, called the townhouse, or townhall, was used for public business. The meeting-house and townhouse usually stood beside a large open grazing-ground, or common, and in early times

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this village center was apt to be placed upon high ground in order that the approach of hostile parties of red men might more easily be detected. On or near the common there was in many villages a fort, or blockhouse, built of heavy timbers, where the people could take refuge in case of sudden attack.[1]

Land was alloted by a system like that adopted by the Virginia Colony. Each shareholder was to have two hundred acres for every fifty pounds that he had invested. If he settled in the colony, he was to have fifty more for himself and fifty for each member of his family. Emigrants who were not shareholders were to have an allotment of fifty acres, with the same quantity for each servant exported. The governor and council had also power to grant a further quantity to emigrants according to their charge and quality.[2]

The constructive work illustrative of New England life will not be complete without a representation of the meeting-house. The children, doubtless, will be interested to learn that no provision was made for heating it for one hundred and fifty years, and that it was not lighted until a late period, when it was used for singing school.

The meeting-house of the first period was the central building of the Puritan town. The village grew up around it, and the country roads were laid out with reference to it. The first meeting-house was built of logs and thatched. The pulpit was a simple desk. There were rough benches on either side of the central aisle. The men sat on one side and the women on the other. Sometimes the meeting-

[1] FISKE, *United States History*, pp. 94, 95.

[2] DOYLE, *English Colonies in America*, Vol. I, p. 92.

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house was surrounded by palisades, with a sentinel at the gate, and the people used it as a place of deposit for powder, and also for their most valuable possessions.[1]

The home of the minister was a "small log cabin, with the old well-sweep outside, and with cultivated fields about it."

The meeting-house of the second period was a barn-like structure, nearly square, with a roof the form of a pyramid, from the center of which rose a steeple. A bell was suspended from the steeple and used in place of the drum or conch shell in calling the people to church.

Although land was alloted by the same methods in New England and in Virginia differences in soil and climate were such as to produce very different modes of agriculture. The failure of attempts in New England to introduce servile labor in agriculture may be noticed, for they serve to bring out essential points of difference in the two sections. If the children have already studied colonial life in Virginia, they will be ready to make the points of contrast; but if not, time may be saved by taking time to bring out these points in a graphic way. The following quotations show important differences in social and economic conditions in the two sections, and these differences may readily be understood by the children if they are given the opportunity to

[1] BYINGTON, *Puritans in England and New England*, p. 110.

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PATRIOTS' DAY EXERCISES—SPINNING SCENE.
(ETHICAL CULTURE SCHOOL, NEW YORK CITY.)

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represent these differences by illustrative constructive work:

A great plantation, with its galleried manor-house, its row of negro quarters, and group of barns and shops, was in a large measure a self-sustaining community. The planter needed little that could be obtained elsewhere in his own colony or in the South, and conducted his commercial operations direct with England, the West Indies, and the northern colonies. Vessels came to his landing, bringing the supplies which he had ordered of his correspondents, and loading for the return trip with such material as he had for export. Under this independent system whereby the rural magnate was his own merchant, and negro slaves his only workmen, neither general trade nor industries could flourish. Manufactures of every sort — even tables, chairs, stools, wooden bowls, and birchen brooms — were, along with many necessaries of life, imported from England and neighboring colonies. There were a few negroes on every plantation who were trained to the mechanic arts; and a small number of white craftsmen found work in traveling around the country, doing such jobs as were beyond the capacity of the slaves.[1]

Small villages, neighborhood centers of the several townships, abounded everywhere. The houses of the minister and school-teacher, with little shops of tradesmen and artisans, formed the nucleus around which the farm-houses were grouped with more or less density. The village streets, overhung with arching elms, were kept in tolerable order by the "hog-reeves," "fence-viewers," and other town officials. The quaint, roomy, gambrel-roofed houses were scroupulously plain and clean, and presided over by model housewifes.[2]

[1] THWAITES, *The Colonies*, pp. 102, 103. [2] *Ibid.*, p. 186.

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After representing the above, the children will be better able to understand the following differences in political organization, which they may be able to represent in various ways:

In the southern colonies the country was traversed by deep, broad river highways, leading far inland; the climate was genial, the savages proved comparatively friendly, and the introduction of slavery tended to foster an aristocratic class of landed proprietors; large plantations, therefore, were the rule. There were a few small trading villages, but the bulk of the people were isolated, and township governments were impracticable. The settlers, therefore, adopted a primary government akin to the English rural county, having jurisdiction over a wide tract of country, with a commander of militia, appointed by the governor and styled a lieutenant, whose duties and authority were similar to those of the lords-lieutenant at home, judicial powers being exercised by eight or more gentlemen, also appointed by the governor, serving as a county court. It should be remembered that the southern county was not, as in England, a group of towns; it was itself the primary organization. The parish was sometimes, in newly settled portions, co-extensive with the county; but more often the latter was, for religious purposes, divided into parishes, the vestries of which had authority in some civil matters.[1]

The tendency of the southern political and social system was to concentrate power in the hands of a few men, in sharp distinction to the New England plan, where the people governed themselves in small primary assemblies, only delegating the conduct of details to their agents, the town officers.[2]

[1] *Ibid.*, p. 56. [2] *Ibid.*, p. 57.

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In New England the narrowness of the Atlantic slope, the shortness of the rivers, the severe climate, the hostility of the savages, the neighborhood of the French, the density of the forests, and the fact that each community was an organized religious congregation — people belonging to one church, who had resolved to live together — led to the establishment of more or less compact communities, called towns; and these were the political and ecclesiastical units.[1]

In the middle colonies, which partook of the climatic characteristics of both their northern and southern neighbors, and had a population made up of various nationalities, there were compact trading towns, as well as large agricultural regions; and there we find a mixed system of both townships and counties.[2]

Almost from the first the Pilgrims were a trading people, and trading continued to be one of the most important industries of the New England colonies. The problem of the teacher is not that of having the children read and recite these facts. It is rather that of helping them to discover in the situation in which the colonists are placed the need of trade, the manner in which it is carried on, and the means by which it can be developed.

First of all the children should consider the equipment of the Pilgrims, their natural environment, and the prospect of their being able to live without engaging in trade. The differences in the productions of the northern, middle, and southern colonies should be noticed, as well as

[1] *Ibid.* [2] *Ibid.*

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the contrasts between their productions and those of the West Indies. The abundance of raw materials for manufacture in the New World and the poverty of their equipment for manufacturing, should be set over against the exhausted condition of natural resources in the mother-country and its good equipment for manufacturing. Such a contrast will make clear the motive of the mother-country in planting colonies for purposes of trade.

The problem of finding out what ships came over from England during the first few years, and what cargoes were taken each way, can easily be solved by consulting text-books, and the points learned may be represented in a graphic way on maps made by the children. The routes of the oceanic trade should be noted, and their relations to ocean currents and prevailing winds. Models or drawings of the ships may be made, and of the harbors into which they came.

A study of the problem of the Pilgrims in securing a cargo to send to the mother-country leads directly to a consideration of the fishermen on the one hand, and of the trappers and traders of the New World on the other.

Accounts of the fishing expeditions along the Atlantic coast may be given, and the relation of the settlement of Massachusetts Bay to the fisheries. The best fishing grounds should be

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represented on the maps, and a study made of the habits of the fish which frequent these grounds in the different seasons. Illustrations of fishing tackle, fishing boats, and the manner of curing and packing the fish may be made.

No phase of this work can be made more fascinating to the children than that of the trade with the Indians. Knowing the furs which are most in demand in England, the children may learn to locate on their maps the places where the animals from which they are taken are trapped. A study of the habits of the animals, the kind of traps made, the life of the trappers as they go their daily rounds, the journey of the trappers to the trading-posts of the colonists, the manner of trade, and the method of transporting the furs to the seacoast are subjects which lend themselves to both story and art. The successive steps in the growth of a trading-post from a meeting-place of the trappers and traders at any spot which suits the convenience of the parties, to the establishment of a permanent trading-post, may be shown on the sand-maps and by means of drawings and paintings.

The following description of a typical trading-post may furnish the teacher with data which she may need in guiding the children in their constructive work. The trading-post stands

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generally upon the second or lower bank of some navigable river or lake, so as to be easily accessible to the boats which annually visit it for supplies. A trading-post is invariably a square, inclosed by immense trees or pickets, one end sunk deeply in the ground and placed close together. A platform, about the height of an ordinary man, is carried along the inner side of the square, so as to enable anyone to peep over without danger from an arrow or bullet. At the four corners are bastions octagonal in shape, pierced with embrasures, to lead the Indians to believe in the existence of cannon. . . . . The entrance to the stockade is closed by two massive gates, an inner and an outer one. In the center of the square stands the residence of the trader in charge, and of the upper class employees, while about its four sides, close to the stockade, are ranged the trading store, the fur-room, the warehouses servants' quarters, etc.[1]

In representing the routes of inland trade in the early days of New England, the children should indicate on their maps the rivers used, the places where portages would have to be made, the trails, the traders with packs upon their backs following the trail, and the fording-places and foot-bridges which were used at that time.

After the introduction of domestic animals, the children should make a new map, or change the old one so as to show the changes made in methods of transportation. They should make drawings of long trains of pack-horses laden

[1] "The Honorable Hudson Bay Company," *Harper's Magazine*, Vol. LIX, p. 22.

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with furs coming down the trail from the trading-post. They may also make drawings which will show the packing of the horses, the resting-places, or any other phase of the journey which interest in the subject may call up.

The change made about 1640, when the trails were widened into roads and ox-carts were used to supplement, if not to supersede, the pack-horse, should also be represented. This map should show ferry-boats at the places where the larger streams intersect the roads, and horse-bridges at the smaller streams. These changes should be related to the changes in the growth of the trading-post.

The construction of models of the ox-carts, harnesses, rope-ferries, and boats presents opportunities for manual training which should not be neglected. The fact that two-wheeled carts did service in trading and farming until after the War of 1812 should be noticed, together with the fact that for many years iron was so dear that people were not permitted to have iron tires on their cart-wheels. In constructing a model of a rope-ferry the children should be encouraged to work out methods which will illustrate the actual manner of moving the ferry across the stream.

The beginnings of shipbuilding in the colonies may be related, on the one hand, to the demand for means of carrying on trading and fishing

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expeditions, and, on the other, to the vast forests in which could be found excellent material for shipbuilding. Lumbering, an important industry from the earliest times, should be viewed as an effort of the colonists to supply materials for trade, for the manufacture of ships, and for lumber for better houses, furniture, and agricultural and household implements. The saw-mill, when viewed in relation to this network of activities, is seen to be an essential factor in securing comfortable homes for the people, ships for carrying on trading and fishing expeditions, and cargoes to exchange for articles which are not yet produced in the colonies.

The middle and southern colonies were able at an early date to supply the New England colonies with domestic animals, grain, cattle, rice, indigo, and cotton in exchange for furs and fish. Long Island Sound served to unite the scattered New England colonists, and to furnish them with a protected route for trade with the middle and southern colonies. These facts may be made clear on the map, which should be referred to from time to time so as to insure real thinking on the part of the children.

Almost every child learns, while studying geography, that New England is a manufacturing country. In view of this fact, the teacher should so present the study of the history of this section

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as to show the child the beginnings of the industries which are of such importance today. The suggestions thus far emphasize the fact that the New England colonies from 1620 to 1640 were largely producers of raw materials which were manufactured in the mother-country. On account of the poverty of the colonists and the remoteness from Europe, many of the necessaries of life were manufactured at home during these years, but the main dependence for manufactured articles during this time was the mother-country.

In studying the beginnings of manufactures, let the children model New England in sand and locate the mountains which, at first, served as a fort and later as a limit to expansion. Then let them model the lowland belt, varying in width from fifty to eighty miles, and contrast it with the much wider belt of fertile land in the middle and southern colonies. Such a view of the country will give a basis for the conclusion that the arable lands will soon be occupied, and that the people must find other work to do. At the same time, it will serve to reinforce the fact that during the first period of the settlement it was far easier for the colonists to maintain themselves by agriculture, fishing, and commerce than by means of manufacturing. Yet even in the early period beginnings were made, and the children may profitably search available books of reference for

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accounts of the first manufactures of salt for the fisheries; of lime and brick for building purposes; of iron for tools; of machinery for the manufacture of agricultural implements; of leather for clothing and harnesses; of cotton, flax, hemp, and wool for clothing; and of lumber for shipbuilding and many other forms of manufacture.

Knowing that the beginnings had already been made before 1640, and that the settlers were pushing westward trying to find larger farms and better pasturage for their cattle, the children are prepared to understand why the civil war in England, which checked emigration and commerce, turned the community in upon itself, and stimulated all forms of manufacture.

Of the many forms of manufactures which grew up at this time in New England, the textile industry is one of the most valuable for educational purposes, and one which can be readily introduced into the schools with little or no expense. For these reasons it is selected at this time, although others may be worked out by the teacher in such a way as to be of great value.

As a supplement to what the text-books state concerning the textile industry, the children may make a brief study of the sources of such raw materials as cotton, flax, hemp, and wool, and the method of preparing them for use. The particular material selected for the children to use in

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First Steps in the Textile Industry.
(Training Department, University of Utah.)

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spinning and weaving depends upon the natural resources of the locality. Where sheep are raised, wool is the most appropriate material to use. In connection with the discussion of the best material for the children to use in their own work, they may find out what materials the New England colonists secured directly from their own locality, and what materials they were obliged to import. The laws made during this period which tended to promote the cultivation of flax and the raising of sheep can be appreciated by the children at this time.

The accompanying illustration will doubtless speak more forcibly than words to the teacher regarding the method of introducing the textile work into the school. It shows children washing the wool, spinning with simple spindles of their own manufacture, carding the wool with home-made cards and weaving on a simple frame which each child can make for himself out of four narrow strips of wood. In teaching this subject, it is not best to attempt to do all this work at once. One day may well be devoted to a study of the wool and to washing and drying it. Another day may be given to experimenting with the wool so as to find ways of carding and spinning it into yarn. Then the looms are to be invented, not given ready-made, for it is in the invention of the apparatus that the chief value of

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the work consists. The spinning and weaving by such devices as the children can invent for themselves serves also to illustrate the nature of the work of the colonists before they had spinning-wheels and looms with foot-treadles.

The children should spin enough yarn with the simple spindle to enable them to appreciate the value of commercial materials and the improved devices by means of which they have been prepared. Then it is perfectly legitimate for them to make use of other materials.

The question regarding what shall be woven in the first work depends largely upon the interests of the children. If they are interested in weaving small pieces to furnish the models of the houses made, they should be allowed to do so; but if they are more interested in weaving something which can be put to some material use, there is no objection to letting them do it. Perhaps the account of the making of the rug which is shown on the opposite page may be suggestive of ways of directing the children's work to ends which combine several valuable points. The children in the fifth grade of the training department of the University of Utah wished to make the principal of that department a present, and thought he might like a rug for his office. When it came to the question of designing the rug, they decided that the pattern they were to

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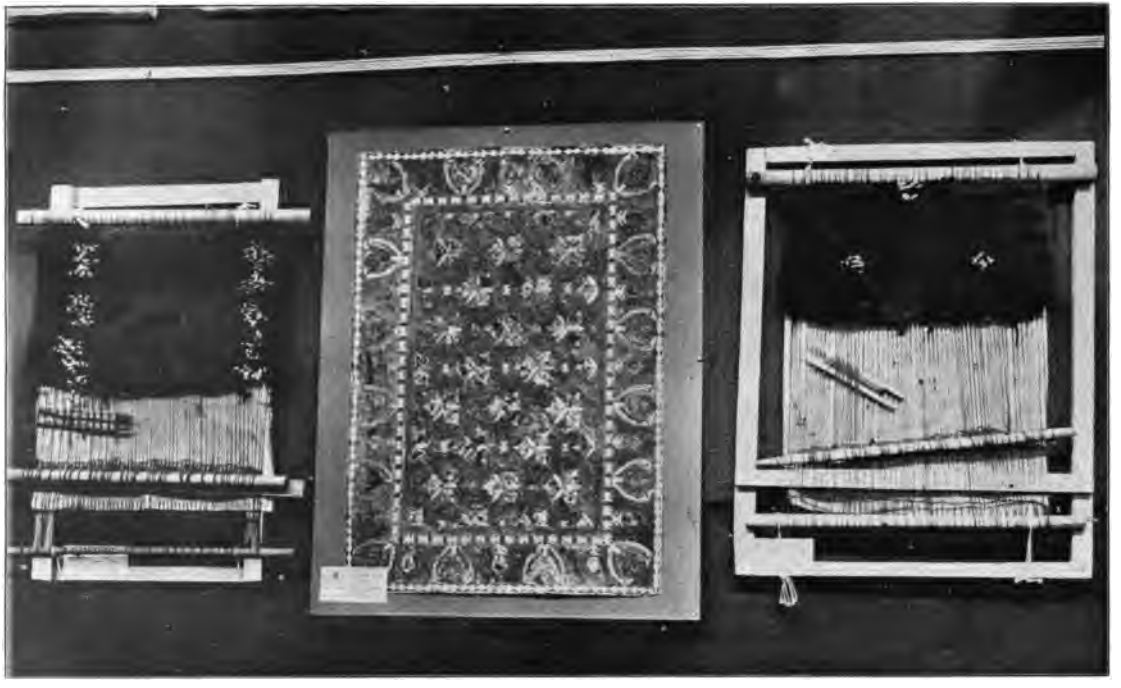

ORIGINAL DESIGN FOR RUG-WEAVING.
(TRAINING DEPARTMENT, UNIVERSITY OF UTAH.)

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make should have a meaning, and they agreed to let it tell something of the pioneer history of Utah. After discussing the subject they chose the blossom of the sago lily—a plant with a nutritious bulb which the pioneers used as food in their "starving times"—and conventionalized it for one of the units of design. Two other units were made by conventionalizing the form of the grasshopper and of the sea gull, a bird sacred in Utah on account of the belief that the sea gulls saved the crops of Utah by eating the grasshoppers which threatened them. The fourth unit of design was secured by conventionalizing the form of the ox-cart used by the pioneers in crossing the plains. The illustration shows the design made, and the accompanying pieces show the method used in weaving it. It is given here as an excellent example of original work which unites the interests of children to those of the school as well as to the larger movements of history.

Children should be encouraged to invent simple designs of their own which have a social significance. The beaver, the canoe, or the packhorse may be used in making designs which will represent the fur trade; the codfish may be used as a symbol of the fisheries; the plow, the spade, and the hoe, as symbols of farming; and the distaff as a symbol of the textile industry. The

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children should be encouraged, too, to invent ways of improving their spindles and looms, and to discover in the more complex forms which they may have opportunity to observe, the essential principles which are used in the crude devices which they have invented.[1]

Colonial methods of dyeing may also furnish occupations of great interest and value to children. In approaching this subject the children should be encouraged to experiment with the juices of the various fruits, stems, leaves, and roots which are available, and to determine what color they will yield and what means to use in order to "set" the color so that it will not wash out.

Mrs. Alice Morse Earle, in *Home Life in Colonial Days*, p. 193, writes:

> Madder, cochineal, and logwood dyed beautiful reds. The bark of red oak or hickory made very pretty shades of brown and yellow. Various flowers growing on the farm could be used for dyes. The flower of the goldenrod, when pressed of its juice, mixed with indigo, and added to alum, made a beautiful green. The juice of the pokeberry boiled with alum made crimson dye, and a

[1] The limits of this chapter forbid giving all the details which the teacher may wish to know. For further information regarding methods of spinning and weaving reference is made to ALICE MORSE EARLE, *Home Life in Colonial Days*, and to an article by OTIS TUFTON MASON, entitled "A Primitive Frame for Weaving Narrow Fabrics," published in the *Smithsonian Report of the United States National Museum*, 1899, pp. 485–510.

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violet juice from the petals of the iris, or "flower-de-luce," that blossomed in the June meadows, gave a delicate purple tinge to white wool.

The relief map which the children make to represent the period of industrial development beginning about 1640 should show that the villages are no longer isolated, but organized for social life. This organization can be indicated by means of roads, bridges, ferries, boats, carts, pack-horses, etc. In 1643 Plymouth colony consisted of three thousand inhabitants, living in eight distinct towns. In addition to this, it had several independent trading and fishing stations along the coast. These should be shown together with the other settlements in New England which we have not attempted to describe at this time.

The children may also make models of the houses which are typical of this period, emphasizing the changes which were made possible by the development of home manufactures. The house of the earlier period may do service at this time in illustrating the dwellings on the frontier and in the isolated farming regions. But in the towns the frame house appears to announce the presence of the saw-mill, an occasional structure of brick and stone bears witness of the dawn of quarrying and brickmaking, and the small diamond-shaped window panes tell of the establishment of glass works.

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The following description, from Weedens' *Economic and Social History of New England*, p. 214, may be taken as typical of the better houses of this period:

> Many of the Connecticut villagers had houses two-storied in front with the roof sloping in the rear to the first story, or still nearer to the base, thus giving the structure a firm hold on the ground. A "lean-to" was very common, and closets were around the chimney and dipped into recesses of the attic. Sometimes they were planned for hiding and concealment. This class of houses had four main rooms, the larger ones often twenty feet square, on one floor. On the ground floor was a parlor, or "great room," for company; a bedroom; a kitchen, the main assembling place of the family; and a milk and cheese pantry.

The sides of the houses were now clapboarded, the roofs shingled, and the windows fitted with glass panes. Stone and brick were now used for chimneys instead of sticks plastered with clay; and hinges of iron replaced those of wood and leather. All these changes bear witness of the progress of the colonists in the manufacturing arts.

There were velvet chairs in the parlors of the wealthy, and woolen curtains, curtain rods, and "vallants" in parlor chambers. The bedroom was seldom heated, and had it not been for the feather bed and heavy woolen bed-curtains, it would have been exceedingly uncomfortable.

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Let the children read descriptions of the ways in which the different rooms were furnished and make models of the furnished rooms. The "turn-up" bedstead so common in colonial homes was usually placed in the kitchen, the warmest room in the house, and was used by the master and mistress. It consisted of

> a strong frame filled with a network of ropes which was fastened to the bed-head by hinges to the wall. By night the foot of the bed rested on two heavy legs; by day the frame with its bed furnishings was hooked up to the wall, and covered with homespun curtains or doors.[1]

In the bedroom there was a high-posted bedstead, with a feather bed above one filled with straw or pine needles. The linen was fine and white, and the bed-quilts were of varied patterns. Coverlets woven in "fanciful and geometric designs" were a favorite bed-covering in colonial days. The warming-pan, used to warm the cold sheets during the winter, was found in the better homes. A bureau with drawers, a washstand, a wash basin, a soap-box, and brush-tray completed the bedroom outfit.

The kitchen was the most important and the most comfortable room in the house. The significance of this room as a social and industrial center has been so well described by Mr. Sheldon in his *History of Deerfield*, Vol. I, pp. 279–81,

[1] ALICE MORSE EARLE, *op. cit.*, p. 55.

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that the teacher will find it rich in suggestions for a great variety of illustrative work. He writes:

The ample kitchen was the center of family life, social and industrial. Here around the rough table, seated on rude stools or benches, all partook of the plain and sometimes stinted fare. A glance at the family gathered here after nightfall of a winter's day may proof of interest. After a supper of bean porridge, or hasty-pudding and milk, of which all partake in common from a pewter basin, or wooden bowl, with spoons of wood, horn, or pewter; after a reverent reading of the Bible, and fervent supplication to the Most High for care and guidance; after the watch was set on the tall mount, and the vigilant sentinel began pacing his lonely beat, the shutters were closed and barred, and with a sense of security the occupations of the long winter evening began. Here was a picture of industry, enjoined alike by the law of the land and the stern necessities of the settlers. All were busy. Idleness was a crime. On the settle, or a low armchair, in the most sheltered nook, sat the revered grandam — as a term of endearment called granny — in red woolen gown and white linen cap, her gray hair and wrinkled face reflecting the bright firelight, the long stocking growing under her busy needles, while she watched the youngling of the flock in the cradle by her side. The good wife, in linsey-woolsey short-gown and red petticoat, steps lightly back and forth in calf pumps, beside the great wheel, or poising gracefully on the right foot, the left hand extended with the roll or bat, while with a wheel-finger in the other she gives the wheel a few short turns for a final twist to the long-drawn thread of wool or tow. The continuous buzz of the flax wheels, harmonizing with the spasmodic hum of the

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big wheel, shows that the girls are preparing a stock of linen against their wedding-day. Less active and more fitful rattled the quill wheel, where the younger children are filling quills for the morrow's weaving.

Craftsmen are still scarce, and the yeoman must depend largely on his own skill and resources. The grandsire, and the goodman, his son, in blue woolen frocks, buckskin breeches, long stockings, and clouted brogans with pewter buckles, and the older boys, in shirts of brown tow, waistcoat and breeches of butter-nut-colored woolen homespun, surrounded by piles of hickory shavings, are whittling out with keen Barlow jackknives implements for home use; ox-bows and bow-pins, ax-helves, rakestales, forkstales, handles for spades and billhooks, wooden shovels, flail staff and swingle, swingling knives, or pokes and hog yokes for unruly cattle and swine. The more ingenious perhaps are fashioning buckets, or powdering tubs, or weaving skepes, baskets, or snow-shoes. Some, it may be, sit astride the wooden shovel, shelling corn on its iron-shod edge, while others are pounding it into samp or hominy in the great wooden mortar.

There are no lamps or candles, but the red light from the burning pine-knots on the hearth glows over all, repeating in fantastic pantomime on the brown walls and closed shutters the varied activities around it. These are occasionally brought into a higher relief by the white flashes, as the boys throw handfuls of hickory shavings on to the forestick, or punch the backlog with the long iron-peel, while wishing they had "as many shillings as sparks go up the chimney." Then the smoke-stained joists and boards of the ceiling, with the twisted rings of pumpkin, strings of crimson peppers, and festoons of apples drying on poles hung beneath; the men's hats, the crook-necked squashes the skeins of thread and yarn hanging in bunches on the

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wainscot; the sheen of the pewter plates and basins, standing in rows on the shelves of the dresser; the trusty firelock, with powder horn, bandolier, and bullet pouch, hanging on the summertree, and the bright brass warming-pan behind the bedroom door — all stand revealed more clearly for an instant, showing the provident care for the comfort and safety of the household. Dimly seen in the corners of the room are baskets, in which are packed hands of flax from the barn, where, under the flax-brake, the swingling-knife, and coarse hackle, the shives and swingling tow have been removed by the men; tomorrow the more deft manipulations of the women will prepare these bunches of fiber for the little wheel, and granny will card the tow into bats, to be spun into tow yarn on the big wheel.

Mrs. Alice Morse Earle's description of the fireplace is also suggestive to the teacher. She writes:

When the great stone chimney was built, there was usually placed on one side of the kitchen fireplace a brick oven which had a smoke uptake into the chimney and an ash-pit below. The great door was of iron. The oven was usually heated once a week. A great fire of dry wood, called oven wood, was kindled within it and kept burning fiercely for some hours. This thoroughly heated all the bricks. The coals and ashes were then swept out, the chimney draught closed, and the oven filled with brown bread, pies, pots of beans, etc. Sometimes bread was baked in pans, sometimes it was baked in a great mass set on cabbage leaves or oak leaves. In some towns an autumn harvest of oak leaves was gathered by children to use throughout the winter. The leaves were strung on sticks. This gathering was called "going a-leafing."

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The children can easily construct models of the great chimney and fireplace, and the oven, and make models of the implements used to hold the logs and the cooking utensils in place. If they make models of the utensils used in the fireplace and put them in their proper places, it will be easy for them to discover the reason for the long handles and long legs of the cooking utensils used in fireplaces, and why hooks were used from which pots and kettles could be hung at varying heights over the fire. Many of the cooking utensils and dishes for serving food may be modeled in clay or whittled out of soft wood. The picture of the fireplace would not be complete without the blocks or stools in the chimney corners upon which the children sat, and the high-backed settle which protected the aged from the strong drafts made by the fire.

In reconstructing the dwellings of colonial times and making models of the furniture, it must be remembered that until 1650 furniture was very scarce. Up to this time it consisted chiefly of a table board which was placed upon trestles, a plain chest which did service as a trunk, a table, or a chair, a settle beside the fireplace and perhaps one high-backed, broad-bottomed armchair for grown-up people only, crickets for the children, and home-made bedsteads and trundle-beds. With the growth of home manufactures and with

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the increased wealth of the people better furniture was made, illustrations of which the children will find no difficulty in procuring, if they once begin the search.

The first of the illustrations on the opposite page shows constructive work which was done by a fifth-grade class without an equipment in connection with the study of colonial history. The second illustration shows work done in the Laboratory School of the University of Chicago when it was fairly well equipped for industrial work. No school is too poor to make a beginning in such work, and, a beginning once made, the work must stand on its own merits.

Colonial methods of cooking may be made an interesting and profitable study. Children in schools not equipped for regular work in cooking can find ways of preparing a colonial supper after finishing this phase of the subject. If, in addition to the meal, the children have on exhibition the constructive work which they have made, and if they explain it to their guests, or read brief papers which they have written on the subjects, the enthusiasm of the teacher and the children will be likely to spread to the parents and friends of the school, who may be instrumental in securing more favorable opportunities for carrying on the work.

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COLONIAL HISTORY.
(STATE NORMAL SCHOOL, OSHKOSH, WIS.)

COLONIAL HISTORY.
(THE UNIVERSITY OF CHICAGO, LABORATORY SCHOOL.)

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The suggestions regarding the practical work which the children can do in connection with the study of colonial history ought not to be completed without mention of the various kinds of work partaking somewhat of the character of a festival. The spinning, quilting, apple-paring, husking, chopping, and stone-hauling bees, the raisings, and the annual soap-making in the spring and candle-making in the fall were full of social significance for the people of colonial days, and the representation of these occupations by means of illustrative, experimental, and real work may be made as valuable to the child. Excellent descriptions of such co-operative industries can be found in the books of Mrs. Alice Morse Earle, who is an authority on the subject of colonial life.

As a preparation for the subject of candle-making the children may make lists of the different ways in which the people lighted their dwellings before they had domestic animals. This list should include (1) the firelight from the fireplace, (2) the pine-knots, full of pitch, called candle-wood and gathered in large quantities each fall when they were stored for the winter's use, and (3) rushlights made by stripping part of the outer bark from rushes and dipping the bare pith into melted fat.

Although most children have seen candles, they may not know the materials used in making

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them. It will be well, then, for the children to find out what materials are used in making candles, and whether the early colonists had such materials. They should compare tallow with lard, so as to understand why candles were made of tallow. Then they can be told of the bayberry wax which the colonists used to make the tallow harder. If they do not know how the tallow is "tried," they may learn in an experimental way by "trying" a small piece of the fat of beef. If tallow cannot be procured easily, paraffin may be substituted for it.

Mrs. Earle's account of dipping candles may be used as a guide in the real work and in the illustrative constructive work and drawings. She writes:

The making of the winter's stock of candles was the special autumnal household duty, and a hard one, too, for the great kettles were tiresome and heavy to handle. An early hour found the work well under way. A good fire was started in the kitchen fireplace under two vast kettles, each two feet, perhaps, in diameter, which were hung on trammels from the lug-pole or crane, and half filled with boiling water and melted tallow, which had had two scaldings and skimmings. At the end of the kitchen or in an adjoining and cooler room, sometimes in the lean-to, two long poles were laid from chair to chair or stool to stool. Across these poles were placed at regular intervals, like the rounds of a ladder, smaller sticks about fifteen or eighteen inches long, called candle-rods. These poles and

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rods were kept from year to year, either in the garret or up on the kitchen beams.

To each candle-rod was attached about six or eight carefully straightened candle wicks. The wicking was twisted strongly one way; then doubled; then the loop was slipped over the candle-rod, when the two ends, of course, twisted the other way around each other, making a firm wick. A rod with its row of wicks, was dipped in the melted tallow in the pot, and returned to its place across the poles. Each row was thus dipped in regular turn; each had time to cool and harden between the dips, and thus grow steadily in size.[1]

In nearly every neighborhood some one has a pair of candle-molds which are similar to those used by the colonists in New England. The making of candles by using such molds is interesting to the child, not merely in itself, but as a means of understanding a phase of pioneer life throughout all parts of the United States. If candle-molds cannot be found, let the children invent candle-molds and make candles in them. The illustration opposite page 236 shows a candle-mold invented by a boy of about eleven years. Candlesticks, too, may be invented by the children and modeled in clay. Pictures of candlesticks, snuffers, and tray may be collected to illustrate this mode of lighting. Simple oil lamps like the old Roman lamps may be modeled by the children in clay.

[1] See *Home Life in Colonial Days*, p. 36.

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Should the teacher desire to let the children try the colonial method of making soap, she will have no difficulty in getting information regarding the process from almost any old lady or gentleman of her acquaintance. It is quite as important for the teacher to acquire the habit of learning from people and from nature, as from books. By making use of different sources of knowledge, and by encouraging the children to do the same, the prevalent habit of regarding the statements made in books as final will be transformed into that of regarding them as means of securing information and helpful suggestions for which a need has been felt. It is hoped that the suggestions given in this chapter will be regarded in this light.

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CHAPTER VI.

CONCLUSION.

"The more things thou learnest to know and to enjoy the more complete and full will be for thee the delight of living."—*Phlalen.*

A COMPLETE consideration of the place of industries in elementary education would require a work of several large volumes. This is merely a preliminary survey of the field for the purpose of getting such a perspective as is necessary in order to evaluate the industrial activities of any age, and to discover the underlying principles which determine the practical application of the materials considered. The applications presented in the preceding chapters are suggestive only. A more detailed application is presented in another place.[1]

In the first chapter we set out with certain fundamental problems. In the succeeding chapters we reviewed various phases of social experience with reference to those problems. In the preceding chapters we have suggested some practical applications. At this time let us make a brief summary of the more important results of the work.

[1] "Industrial and Social History Series," Rand, McNally & Co.

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In reviewing the more important industrial epochs we have found that in each there is a close relation between the dominant industry of the period and the natural and social environment of the people. Each dominant form of industry is conditioned by its environment and, in turn, conditions all other forms of activity. A change introduced into any part of an industrial process affects not merely the entire process, but its influence permeates every department of life.

The introduction of a new motive power means, on the one hand, the introduction of a new means of applying that power, and, on the other, a new form for the organization of labor. An advance in the use of a new material is attended by similar changes. Whether the advance be in the form of the use of a new material, the conquest of a new force, or in the more economical application of the same, it inevitably reacts upon the lives of the workers so as to develop a different quality of life, a different mode of interpreting phenomena.

The type of man's emotional reactions was fixed by the conditions of life in a dangerous situation, but his attitudes have been modified, under the influence of social approval, by the activities of succeeding ages. Throughout long periods all activities were dominated by the con-

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ditions attending the fierce struggle for existence, the very difficulty of the struggle making it necessary for the individual to accumulate energy sufficient not only for the ordinary affairs of life, but for the emergencies as well. It is due to this fact that man accumulated surplus energy, which, when not needed in the serious activities of life, was expended in some form of art or play. In expressions of playful activity the formed physical co-ordinations and emotional attitudes united in favoring a discharge along lines marked out by the serious activities of life.

Under the influence of personal need and social approval man gradually learned to refrain more and more from purely instinctive action and to secure, through the exercise of associative memory, more indirect and economical modes of response. The advantage of such acts, once being perceived, was made subject to more conscious control. The increasing complexity of the situation was thus paralleled by an increasing complexity in man's response. Life became more complex. The problem, which at first was plain and direct, became more and more obscure. The emotional reactions were lost, and it became necessary to rely upon artificial means of sustaining activity.

In the earlier periods labor was the part of all and was attended by strong feelings of pleasure

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that always accompany the normal exercise of the workmanship instinct. In the barbarian stage of culture a division of labor was made which assigned the less intellectual occupations to slaves. The associations thus made resulted in a disdain for labor which characterized the leisure class of that period. Later, in the ancient civilizations of the city-states, religion placed such restrictions upon labor as to lend its sanction to regard as wrong what had previously been regarded merely as ignoble. These restrictions deprived the leisure class of the pleasure attending the normal exercise of the workmanship instinct, and the laboring class of the conditions essential to securing attention and the normal action of the necessary reflexes. The emotional reactions were thus lost, and labor became irksome.

The changes resulting from the organization of labor under the handicraft system were such as to separate the entire process into so many lesser activities as to obscure, in the minds of the workers, the complete view of the situation. Later, when wind and water power were substituted for human and animal power, and, finally, when the almost universal use of steam transformed the entire industrial organization, the minute division of labor made necessary by the change still further obscured the view of the process as

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a whole. Owing to the rapidity of the change wrought by the use of steam, and on account of the fact that under this system it is possible to utilize a great amount of unskilled labor, no adequate provision has been made for such an education of the mass of workers as is necessary in order to preserve the balance between the technique of the entire process and the intellectual and moral character of all classes of workers.

How the simple forms of industry have affected the development of the arts and sciences; how the gesture language of the pantomimic dance, which was closely related to practical activities, developed into dramatic poetry; how, later, it took the form of the festival and only gradually became free from the serious activities of life; how epic poetry was first bound up with such activities; how, as people became more conscious of the significance of their acts, the heroic song arose, which, first sung by the people, finally was sung by a professional singer; how, finally, it made itself free from music; how the freeing of epic, lyric, and dramatic poetry succeeded each other in obedience to laws similar to those which govern the freeing of architecture, sculpture, and painting; in short, how the typical steps in the evolution of the various arts and sciences have been taken, are problems which we have been obliged to pass with little notice.

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With regard to the child, we have noticed the correspondence between his psychical attitudes and the ancient activities that underlie our industrial processes. These attitudes persist in the child, not as serious activities, but as idealized or dramatic representations of the same. In many cases they appear as reductions of the original activity which have become incorporated into later formed co-ordinations.

It is the function of education to lay hold of these native reactions and to graft upon them habits related to the society in which we live. In later infancy *play* is the prime agency by means of which the native reactions may become transformed into a multitude of co-ordinations; in childhood play is supplemented and gradually superseded by the *constructive activity*, which begins to manifest itself in the period of infancy. For several years construction holds the sciences and arts within itself; but, gradually, they become more and more free.

The natural demand of the mind in all stages of its development for the completion of a situation requires that an opportunity be presented for the exercise of the instinct to exploit the environment in the search of raw materials, the exercise of the workmanship instinct in the process of manufacturing the same, and the exercise of the social instinct in the consumption or use

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of the articles produced. In fact, the social instinct affects each step in the process. The desire to enhance one's personality under the stimulus of social approval operates to form habits of industry which condition all higher forms of activity.

The process of socializing the instinctive activities of the child is greatly facilitated by the use of racial experiences. Collective industries are of value in this connection, for in such activities the individual for the time loses himself in the consciousness of the group. The representation of great public works, which may lie beyond the limits of sense perception, stimulates the imagination, widens the sympathies, and establishes a feeling of kinship with a larger world.

We have seen that the instincts and attitudes that underlie industry are those that underlie the sciences and the arts. They are the common heritage of mankind. If conditions are such that they can find opportunity for normal expression they afford pleasure to the individual and, at the same time, serve as useful instruments of social service. If denied a normal expression in keeping with the stage of development of the individual and the society in which he lives, they are apt to suffer atrophy through disuse, or to be diverted into anti-social forms. In either case

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the individual is deprived of the joy that attends the normal exercise of his full powers, and society is deprived of his legitimate service.

Society can no longer afford to suffer such loss as attends this neglect. It is the part of educators to sift the experiences of the past, so as to preserve that experience which is helpful and to reject that which tends toward the loss of any part of the full heritage of each child. It is only too evident that there has been a tendency in the school to neglect the development of the normal attitudes of the child and to cultivate abnormal ones by imposing the formulated results of a highly organized system upon the child, who is not yet able to assimilate such material. Education is beginning to be established upon a firmer basis, however, and we may hope for more rational methods in the near future.

It is not too much to expect that the marvelous change wrought in the industrial world by the application of modern science to industrial processes will be paralleled by as remarkable an advance in education. It was natural and right that science, whose roots strike deep into the industries of the past, should, on becoming free to express itself on its own account, return with its first fruits to the parent stock from which it sprang. In this way it has laid a broad foundation for its own further development; it has

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created a demand for that which it alone can give, and, at the same time, it has suggested the possibility of a similar application to new fields.

As yet we are only beginning to know the child. We have become well enough acquainted with him to realize that there is an enormous waste in current educational methods, but comparatively little has yet been done to utilize this waste. We must call science to our aid if we would make an economical adjustment of the motive power in education to the work to be done. We must study the child in his environment. Dr. Loeb[1] has demonstrated with lower forms of life how instincts may be changed by changing the temperature, light, or other external conditions. Our own experience in regard to the change in attitude that accompanies a change in our natural or social environment indicates that the truth to which Dr. Loeb has called attention is not confined to the lower orders of life. It ought to be possible to make such a study of child-life under various conditions as to determine in a much more minute way than that here outlined, and with scientific accuracy, the normal attitudes of each stage of development, as well as the conditions best adapted to secure and maintain them.

This work can best be accomplished by the

[1] JACQUES LOEB, *The Physiology of the Brain*, pp. 198, 199.

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departments of education in our great universities in co-operation with the departments of those sciences that are tributary to the same. The fear that something will be lost in life if it is subjected to an interpretation through the media of physical and chemical laws is no better grounded than the fear that the Bible will suffer when subjected to the search-light of the higher criticism. That which is true and that which is holy cannot suffer by being subjected to the most rigorous tests. Such processes, by means of separating the transient from the permanent factors, the non-essential from the essential, serve to illuminate the truth so as to greatly multiply its power. The various search-lights of truth sent out by the different departments of science cannot fail to disclose facts which will serve to mutually check or reinforce one another.

From the practical workers in the elementary schools we may expect valuable contributions. By the very nature of their duties they cannot take the attitude of the investigator. Synthesis rather than analysis, art rather than science, gives color to their work. It would be a mistake to destroy this attitude by requiring attention to new questions that make such a demand upon the analytic habit of mind as to interfere with the synthetic. If, however, such a training[1] has pre-

[1] It is to the Normal Schools that we must look for this training.

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ceded the practical work as will enable one to duly subordinate analysis to synthesis, results of real value may be expected from such sources. There is need of co-operation here as elsewhere in order to secure the best results. The best results of co-operation between those who are engaged largely in the work of investigation and those who are occupied chiefly with the practical work will come when the latter are free to follow interests which have a direct relation to their own practical problems. In many cases the results of the experience of the practical workers will be best gained by means of informal conferences between them and the scientific investigator. In other cases more systematic work may be carried on by the practical worker in co-operation with the investigator. Parents and teachers, better than any other people, can know the spontaneous activities of the child. They can determine the attitude of the child toward various activities and toward the various tools and materials with which he comes in contact. The physician can determine better than any other the physical conditions. The scientific investigator can supplement this knowledge by the results of various experimental tests and can correlate the available results of all methods used.

The work of furnishing nutritious materials for

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an all-round growth of mind in the successive stages of development is not an unimportant one. While it is true that if there were less pressure from above regarding the question of the acquisition of certain formulated results of civilization, the teacher and children would occupy themselves with more vital questions than many of those to which much attention is now given, we can expect no really cumulative results until the materials of instruction are organized more definitely with reference to the attitudes of the child. This fact should be recognized by the makers of our text-books. Much of what is vital to the child now remains stored away in the dusty alcoves of our great libraries.[1] Few but specialists make use of these materials; and, hitherto, little effort has been made to make any use of them with reference to the needs of children. There is need of laying hold of these rich stores of experience and of organizing them in such a way as to render them available for general use. There is need of incorporating in text-books for children such a presentation of the problems of racial life as corresponds to the child's own attitudes. There is need of presenting these materials in such a way as to enable the child to take the initiative in determining his

[1] This does not imply that there is not much valuable material for the child in the practical life of the present.

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problems and methods of work. In addition to this the text-book should present typical racial experiences that afford an opportunity for the child to grasp a broader significance of his own acts. In the earlier stages, before differentiation of interests becomes strong, such materials represent literature, history, science, arithmetic, reading, language, construction, art, and play—all in one. As the child's interests begin to differentiate there is a need of a corresponding differentiation in subject-matter.

Arithmetic, which at first is merely one phase of experience, comes more nearly to represent an interest in itself; but for a long time it should not be divorced from the content of life which gave rise to it. It is true that arithmetic has a content of its own, but it is also true that not until the elementary period of education is passed does this content appeal to the ordinary child in such a way as to make the experience gained by such an isolated activity of any great educational significance. Till such a stage is reached the text-books used should be of such a scope as to include the subject-matter out of which problems of the various types arose. It may well be left to the text-book in industrial history to furnish a more complete account of such situations; enough should be included in the text in arithmetic to insure an easy connection between the technique

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of the problem and the experience of which it is but a phase. Only when presented in relation to the industrial activities of which it is a phase is there an excuse for the introduction of an obsolete method of commercial transaction in our text-books in arithmetic; only when in such relations is it possible for it to become an experience of value to the child. When introduced in such connections, when its function as an instrument of life under certain conditions is evident, its introduction into the course of study is justified on the same ground as the introduction of an obsolete industrial process.

That which is vital in the past lives on throughout all time, but its function appears to change. That which ministers to the physical needs of one age is significant with reference to the intellectual and spiritual needs of succeeding ages. This should not be construed to mean that that which ministers to physical needs is not capable of ministering to the higher needs at the same time. It is. The fact that the satisfaction of material needs occupies so large a field of consciousness tends to obscure other results of the industrial process. Obsolete processes are more significant in the education of the child than modern ones, not because they are obsolete, but because they represent a technique more nearly adapted to the ability of the child. A conscious

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recognition of the values that are implicit in industrial processes will do much to multiply their power. What the simple obsolete processes are to the child, modern complicated ones should be to each and every worker who participates in the process.

On this ground the place of the industrial activities of the past in education is limited only by our ability to appropriate these activities to higher purposes. To pave the way to a more easy appropriation of such resources and agencies in the cause of education is an ideal of such potency as to transform the prolonged work necessary to the realization of even a small portion of the field into the character of play.

What is true of arithmetic is also true of science, art, manual training,[1] and, in short, of each subject of study that has a legitimate place in elementary education. It must not be forgotten that this entire period is pre-eminently an experience stage. The success of the later differentiated activities depends largely upon the maintenance of such conditions as will insure a full use of the activities characteristic of the successive stages. Only when such conditions are

[1] In this connection the reader may be interested in "The Place of Manual Training in the Elementary School," by JOHN DEWEY, *Manual Training Magazine*, Vol. II, p. 193, and "The Thought Side of Manual Training," by ARTHUR W. RICHARDS, *Ibid.*, Vol. III, p. 61.

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secured is it possible to transform and preserve the emotional attitudes, which are significant in some form throughout life. Only under such conditions is it possible for the child to acquire a broad, rich, and vital experience sufficiently deep-rooted to furnish the impulse to the many-sided interests of maturer years.

The fact that so little attention has been given in this place to the selection of simple activities from modern life for purposes of education, should not be interpreted as a failure to recognize their educative value. There need be no conflict between that idea and the one here emphasized. Emphasis is placed upon the evolutionary aspect, because it is believed that we can know what we are only by knowing what we have been. It is because this method reveals the principle of growth so clearly that even the child can appreciate it, that it deserves the place in education which we have assigned to it. As this principle comes to stand out more and more clearly, and as the materials for the enrichment of the child's activities are sought from parallel phases in contemporary life, as well as in the past, there is introduced into what otherwise might be a mass of confused ideas regarding the condition of contemporary life a principle of order, by means of which it is possible to place the various peoples with reference to the forces

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that have been potent in determining their stage of culture.

The objection sometimes urged that it is difficult for the child to picture conditions far removed in space and time has no foundation. When we pass beyond the limits of sense perception, it makes no difference to the child, for several years, from what age the subject is drawn, provided that it represent an experience of a type similar to his own emotional attitudes. Not until the transition from infancy to childhood has been made are space and time important factors in determining the source from which the materials for the enrichment of the child's experience should be drawn. At that time his attitude toward the objective world is such as to make them more important factors; but at no time during the elementary-school period does interest in space and time assume such importance as to nullify the principle that finds recognition in the presentation of such problems and materials as satisfy the spontaneous activities of the period.

Practical activity which is an expression of the child's interests and capacities, socialized by racial experience, is not only the best means, but the only means thus far discovered by which the child can organize the subject-matter of education. It finds its justification in the race

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parallel, in the fact that it is the way the child learns before he comes to school, the way he can lay the best basis for the later activities of life, and the way he will continue to learn after the walls of the schoolroom are left behind. It is a superficial treatment of the question which gives the impression that it is a radical departure in education. A closer examination reveals the fact that it is much more conservative than methods in common use. They represent the radical departure from the path marked out by human experience. This method would conserve what is best in the past; it would build upon it; it would lay hold of our social inheritance in such a way as to enable the child to reconcile the past with the present and to know himself and his place in the world.

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